THE MARINE REVIEW

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LAUNCH OF NEW RED STAR LINER LAPLAND.

The launch of the fine large steel screw steamer Lapland, which took place at Belfast on June 27, is an event of considerable importance to shipping and international commerce. The Lapland, the latest and most notable addition to the Red Star line, has been constructed at Messrs. Harland & Wolff's yard and will be a fit companion to the other leviathans of the deep that are constantly being turned out at that establishment. She will be by far the largest vessel sailing under the Belgian flag, being over 620 ft. long by 70 ft. beam, and 50 ft. deep. Her tonnage will be about 18,000 and displacement about 30,000. The vessel is being built in accordance with the requirements of the British board of trade and the American and Belgian laws for passenger vessels, her construction thus illustrating that development of international commerce and unity which the Red Star line has done so much to promote in its important service between Antwerp and New York, Philadelphia, etc. The name of the vessel—Lapland—is also well chosen (as with the other vessels of the line), adding significance to the community of interests with which this well known company is identified in its commercial relations. The Lapland will be a worthy link in the chain of commerce which is binding ever more strongly together the old world and the new in ties of mutual interest and interdependence.

The Lapland is designed to carry a large quantity of cargo and a large number of passengers—first, second and third class—for all of whom accommodation on the most approved principles will be provided—in fact, the new vessel in every respect will represent the highest excellence of the ship builder's art.

The Lapland is an exceptionally strong vessel, having nine decks and being built on the cellular double bottom principle, the double bottom extending the whole length of the ship, the depth of the inner vertical keel being 4 ft. 6 in. throughout, excepting under the engines where it is increased to 5 ft., the object of this of course being to give still greater rigidity in the vicinity of the machinery. The vessel has 10 watertight bulkheads, being thus divided into 11 watertight compartments. There is also a center line bulkhead in the cargo holds and between decks. The double bottom of course in addition to being an element of strength and security, provides space for water ballast, which is also carried in the fore and aft peaks.

The arrangements for cargo are of the most approved kind. There are six cargo holds, and the bunkers are arranged so that the vessel can be completely coaled from either side. When completed the Lapland will be a very sightly vessel, with four masts and two funnels. The cargo derricks are of the tubular type, and the other appliances for working ship and cargo are also of the latest pattern.

The first class state rooms in the Lapland are placed on the two uppermost decks and will be exceptionally spacious and airy. They are situated on the shelter deck forward and the bridge deck, and a feature in connection with this accommodation is the number of one-berth rooms. There are also cabins arranged en suite, with private lavatory and bath room adjoining. Moreover, all upper berths in first class state rooms are folding berths, which gives a more roomy and tidy appearance than the ordinary arrangement.

The first class saloon is situated on the main deck forward. It is a handsome apartment, the decoration consisting of paneled work finished flat white, relieved with carving and old gold. The room will seat 320, the tables being arranged on the popular restaurant principle. In this room a balcony has been arranged over the center, with accommodation for a band, which will discourse music during meal times as in the continental cafes.

The first class lounge and reading room, also the smoke room, are on the promenade deck. The lounge is in oak, and the smoking room is also in oak, with Dutch tiles. The reading room will be in white, of very artistic design. The first class entrance is in paneled oak, with ceiling of special design and handsome glass dome. There are also artistic glass domes over the smoke room and reading room, greatly adding to the attractive character of these apartments.

The second class state rooms are on the shelter and upper decks, and the second saloon on the main deck aft. This is also a very fine apartment, decorated in white relieved with gold, and will seat 220 passengers. The second class library is on the bridge deck and the smoke room on the promenade deck.

The permanent third class accommodation is on the main deck aft and the upper deck, including a great number of enclosed cabins.

The total number of passengers and crew provided for will be nearly 3,000, and, in addition to the other attractions of the vessel, the different classes of passengers will have the benefit of large clear promenading spaces. In the first and second class

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this is specially noticeable, and the third class passengers will have a sheltered promenade forward, the forecastle being given up entirely to them—in fact, all the arrangements have been conceived on the most generous scale, with the object of meeting the requirements of the respective classes of passengers. The first class passengers will have the benefit on the upper promenade deck of the introduction of an arrangement of large frameless plate glass windows along the sides, doing away with the old canvas screens, the passengers thus having a covered-in promenading space without any interruption in their view of the horizon. The windows can be lowered and kept in any position by an ingenious arrangement of springs, making the deck an ideal promenade.

The vessel will have a refrigerating installation for provisions and a complete system of cold storage. Special attention has been given to the heating and ventilation, which will be as perfect as mechanical ingenuity can ensure.

The passengers' comfort has also been specially studied in arranging the galleys and pantries, with a view to the rapid and efficient serving of meals, also in the provision of an electric elevator for conveying passengers from one deck to another.

The vessel will be fitted with the latest and most improved Marconi system, and will also have a submarine signalling apparatus.

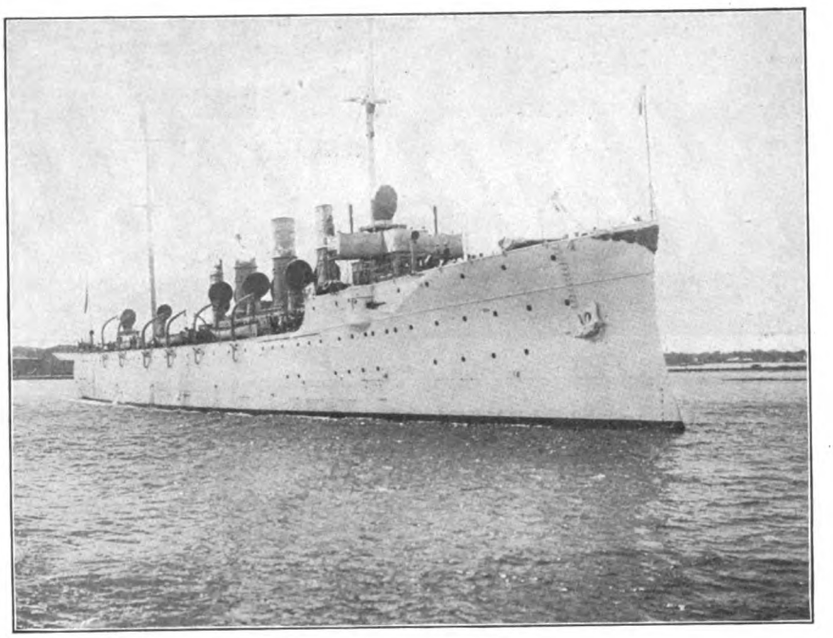
The steering engines and gear are of Harland & Wolff's latest type. This gear, with which, by means of an ingenious arrangement of steel springs, the shocks and strains on the rudder are minimized, has long been regarded as an important element of safety in a ship.

The propelling machinery consists of two sets of quadruple expansion engines arranged on the "balanced" principle, which has been so successful in eliminating vibration.

UNITED STATES SCOUT CRUISER TRIALS.

Herewith is published a table showing comparison of trials of the Birmingham, Salem and Chester, scout cruisers, the Birmingham having reciprocating engines, the Salem Curtis turbines and the Chester Parsons turbines.

The Salem's official trials commenced on June 23 with the standardization of the screws. On Thursday the four-hour run at full speed was made, followed on Friday and Saturday by the 24-hour endurance run at 12 knots, and the 24-hour endurance run at 22½ knots was made on Tuesday and Wednesday, June 30 and July 1 respectively.



SCOUT CRUISER SALEM.

The anchor and maneuvering tests were also completed satisfactorily, the turbines being reversed from full power at approximately 25-knot speed, the turbines turned astern in 40 seconds from signal and the ship moved astern in 2 minutes and 48 seconds from signal.

Item.	Birmingham.	Salem.	Chester.
Standardization—			
Best uncorrected run on course, knots	25.192	26.886	26.22
Means of best pair of runs, knots	24.477	26.11	25.138
Mean of five high runs, knots	24.236	25.957	25.074
R. P. M. for 24 knots	187.23	335.2	507.25
R. P. M. for 22.5 knots	170.38	312	466.4
R. P. M. for 12 knots	89.7	165	245.5
Full Speed—4-hour Trial—			
Mean speed for 4 hours	24.325	25.947	26.52(?)
Best two hours	.....	26.01	.....
Mean R. P. M. for 4 hours	191.66	378.39	614
Coal per hour, lbs	29,904	38,502	38,332
I. H. P.	15,540	.....	.....
B. H. P.	.....	19,200	Unknown
Coal per I. H. P. per hour	1.92	1.81	Unknown
Coal per B. H. P. per hour	.....	2.01	Unknown
Knots per ton of coal	1.822	1.51	1.548
Twenty-four Hours at 22.5 Knots—			
Mean speed for 24 hours	22.665	22.536	22.78
Mean R. P. M.	172.1	312.535	473.5
Coal per hour, lbs.	20,510	18,485	18,063
I. H. P.	10,760	.....	.....
B. H. P.	.....	9,340	Unknown
Coal per I. H. P. per hour	1.91	1.78*	.....
Coal per B. H. P. per hour	.....	1.97	Unknown
Knots per ton of coal	2.47	2.73	2.82
Twenty-four hours at 12 knots—			
Mean speed for 24 hours	12.228	11.93	12.2
Mean R. P. M.	91.4	164.11	250
Coal per hour, lbs.	4,629	4,051	4,091
I. H. P.	1,600	.....	.....
B. H. P.	.....	1,360	Unknown
Coal per I. H. P. per hour	2.89	2.68*	.....
Coal per B. H. P. per hour	.....	2.98	Unknown
Knots per ton of coal	5.965	6.6	6.68

*Equivalent I. H. P. based on assumption of 10 per cent engine friction.

During the year, 1,506 vessels of 588,627 gross tons were built and numbered in the United States, of which 75 steel steamers of 304,379 gross tons were built on the great lakes. The largest annual output heretofore was in the year 1855 when 2,024 vessels of 583,450 tons were built. In that year the great lakes built only 263 vesels, of 45,423 tons.

MERCHANT SHIP BUILDING IN THE UNITED STATES.

Returns to the bureau of navigation show that the fiscal year ended June 30 has been the record year of American ship building, and that the center of the industry is on the great lakes. This year steel vessels built numbered 142, of 417,167 gross tons, compared with 360,665 tons built last year. These two are the years of the largest steel construction in the United States.

The tonnage built is entirely for domestic transportation, no vessels

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exclusively for foreign trade having been built in the United States.

Of the 142 steel vessels, 85 exceeded 1,000 gross tons each, 55 on the great lakes, the largest being the William M. Mills, of 7,962 tons, and 30 on the seaboard, the largest being the Columbian, of 8,579 tons, built at San Francisco for trade to Hawaii.

Four wooden sailing vessels exceeding 1,000 tons each were built during the year, the largest being the Edward J. Lawrence, of 3,350 gross tons.

TWO YEARS' SHIP BUILDING.

The bureau of navigation reports 1,151 sail and steam vessels of 500,327 gross tons built in the United States and officially numbered during the year ended June 30, 1908, as follows:

	WOOD				STEEL				TOTAL	
	Sail		Steam		Sail		Steam			
	No.	Gross	No.	Gross	No.	Gross	No.	Gross	No.	Gross
Atlantic and Gulf	108	32,667	328	12,792	1	63	52	87,311	489	132,833
Porto Rico	8	83	1	11	..	.....	..	.....	9	94
Pacific	15	3,084	266	25,958	....	.....	11	24,850	292	53,842
Hawaii	..	.....	1	14	....	.....	1	.....	1	14
Great Lakes	4	52	86	3,193	....	.....	75	304,379	165	307,624
Western Rivers	....	.....	192	5,356	....	.....	3	564	195	5,920
Total	135	35,836	874	47,324	1	63	141	417,104	1,151	506,327

During the corresponding year ended June 30, 1907, 989 sail and steam vessels of 423,577 gross tons were built in the United States and officially numbered, as follows:

	WOOD				STEEL				TOTAL	
	Sail		Steam		Sail		Steam			
	No.	Gross	No.	Gross	No.	Gross	No.	Gross	No.	Gross
Atlantic and Gulf	145	16,616	308	14,748	9	5,852	71	116,459	533	143,675
Porto Rico	5	51	....	.....	....	.....	....	.....	5	51
Pacific	14	3,182	165	15,670	....	.....	1	8,579	180	27,431
Hawaii	....	.....	....	.....	....	.....	....	.....	....	.....
Great Lakes	3	35	60	1,694	....	.....	47	238,713	110	240,442
Western Rivers	....	.....	155	5,064	..	.....	3	1,914	161	6,978
Total	167	19,884	691	37,176	9	5,852	122	360,665	989	423,577

COMPARATIVE STATEMENT.

1908			1907		
Sail and Steam	1,151	500,327	Sail and Steam	989	423,577
Unrigged	355	88,300	Unrigged	375	510 288
Total	1,506	588,627	Total	1,364	510,865

ORIENTAL TRADE IN JEOPARDY.

By a recent ruling of the Interstate commerce commission, embodied in subdivision 86 of tariff circular No. 15A, compelling railroads to publish their share of through rates for trans-Pacific shipments, it is claimed by Pacific coast shipping men that their present prosperous commerce with the Orient will be entirely extinguished, the Puget Sound and Tacoma region being especially affected.

This circular was revised Feb. 3, 1908, approved March 9, and was to have become effective July 1. Concerted action on the part of those whose interests are affected has, however, resulted in the postponement of the time when the new ruling shall take effect to Nov. 1.

Meanwhile steamship and railroad interests are thoroughly aroused and intend within the next few months to bring about a revision of the ruling. To this end data are being collected showing how the decision discriminates against trans-Pacific traffic in favor of the Suez canal route.

The requirements of the new order are that the railroads shall make public their pro rata share of the through rates, and as is well known, through rates from any of the eastern portions of the United States to China or Japan via Tacoma are divided between two or three railroads and a steamship company. The commission has recognized its lack of jurisdiction concerning the oversea carriers and has not therefore required the steamship companies to publish their share of the rates, but it does demand that the railroads do so.

In order to meet Suez canal competition the trans-continental railroads, as a rule, are obliged to quote almost as low rates on overland freight to the Orient as on merchandise consigned to Pacific coast points. With the publication of their share of through rates, it is declared, the railroads will be obliged to maintain the same rates on domestic freight in order to make a profit. Were they to quote proportional rates, leaving the rates to the Orient at the same figures as at present, they would be driven out of business. In other words they cannot quote export rates less than their domestic rates.

The result will be, it is declared, that the railroads will maintain present tariffs on domestic freight, which forms the large bulk of their business, and retire from the trans-Pacific trade.

At present through rates via the Pacific coast to the Orient, or vice versa, are higher than via the Suez canal. However, the Pacific route has the advantage of much quicker delivery. Still with the trans-Pacific companies there is a continual effort to reduce rates in order to meet Suez canal competition.

For instance, cargo from Pittsburg is usually delivered at Yokohama in 25 days, allowing 10 days by rail to Tacoma, and 15 days across the Pacific. Via the Suez canal it takes twice as long, allowing two days to New York and about 48 days from that port to Japan via the canal.

It will at once be seen that the steamship lines operated by the railroads themselves will be less affected than will the independent fleets which are operated under traffic agreements with the railroads. Of the latter class are the Holt steamers and the vessels operated by the Waterhouse interests, both of which have an excellent trade abroad. The Canadian Pacific and Southern Pacific railways own their own steamship lines, while the Oregon Railroad & Navigation Co. has a number of chartered steamers operating out of Portland.

Steamship men assert that thousands of tons of freight now going overland and being transshipped to the Orient at Puget Sound ports will find its way to New York and thence via the Suez canal to the far east. Thus Pacific coast trade to Asiatic countries will be confined exclusively to cargo originating in that territory, consisting almost exclusively of lumber, flour and grain. That this will mean a great reduction of traffic is apparent when it is known that the outward freight of these lines comprises a collection of such articles as tobacco, cigarettes, heavy machinery, cotton and piece goods, raw cotton and much other miscellaneous cargo from the eastern manufacturing centers.

The return cargoes of thousands of tons of Oriental products will also be diverted to other routes and there will be but little further importation of hemp, tea, silk, fireworks, matting, porcelains, Chinese curios and the like through our Pacific coast ports.

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Altogether the problem appears to be one of serious aspect for the westerners and they are preparing a vigorous voicing of their wrongs through the press, to their representatives at the seat of government, and through the various commercial bodies, in an effort to obtain a revision of the ruling whereby it will be possible to continue this valuable traffic.

LAKE SHIP YARD METHODS OF STEEL SHIP CONSTRUCTION.

BY ROBERT CURR.

Fig. 26 shows completed plan of part of the spar deck.

This plan takes in two outer stringers A A, one inner stringer B, continuous seam strap C, outer stringer double butt strap D, inner stringer double butt strap E, stringer angle F, and hatch coaming G, all of which add to the longitudinal strength of the vessel.

The stringer plates, outer and inner, are 24′ x 60″ x 1″; stringer angle, 6″ x 6″ x 7/8″; hatch coaming channel 12″ x 7/16″; butt straps outer stringer bottom, 11/16″; butt strap outer stringer top, 12/16″; butt strap inner stringer bottom, 11/16″; butt strap inner stringer top, 12/16″, all of which will be considered in the following example.

The shift of butts are so arranged that they are three frame spaces apart equal to nine (9) feet between stringer butts on the alternating butts.

The continuous seam strap butts come two frame spaces apart from the stringer plate butts and is equal to six (6) feet. This is considered a good shift of butts and nothing less should be adopted in any case throughout the ship.

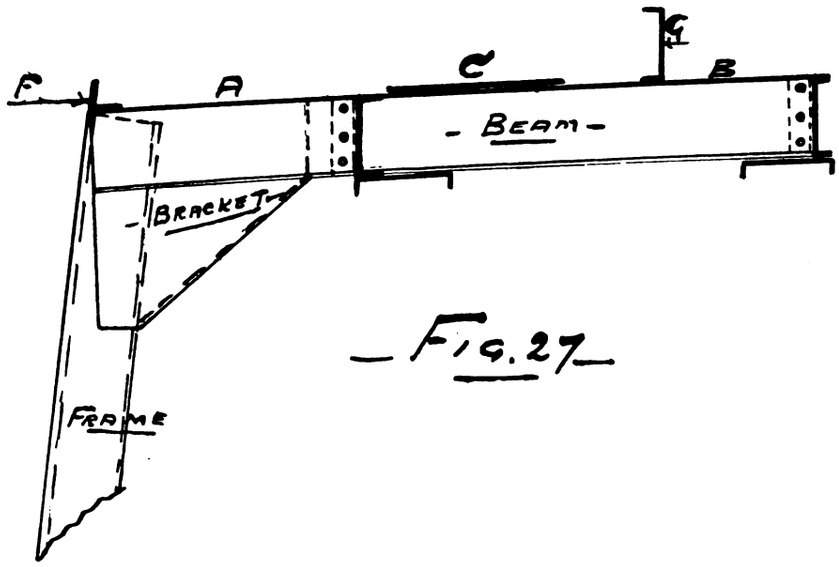

Fig. 27

Fig. 27 shows a cross section of the stringer plating and the parts to be considered in the following example.

Fig. 28 shows the riveting of these parts illustrated in Figs. 26 and 27.

This sketch shows the nine (9) feet shift of stringer plate butts between the two stringers, the after end of outer stringer No. 12 and fore end of inner stringer No. 12.

The unavoidable weakest section of the stringer plating is shown through beam rivet holes X X.

The solid material through the beam X X amounts to 120 inches.

The material through the line X X when punched amounts to 99.82 square inches.

This reduction is caused by the punching of 17 rivet holes.

The rivet holes being countersunk increases the size of the hole.

Fig. 29 shows a sketch of the rivet hole after being countersunk, the size is taken at half the thickness of the plate being 1 3/16 in diameter.

The punched rivet hole is 15/16 inches and when countersunk is 1 6/16 inches, making 1 3/16 inches in the middle of the plate as shown by sketch. 99.82 × 26 = 2595.32 tons the unavoidable weakest section of the two spar deck stringer plates.

The butts have double butt straps and gives the one-inch rivets a value equal to 36 tons per rivet.

The value of the riveted butt for one plate amounts to 46 × 36 = 1646 tons. 1646 × 2 = 3292 tons, being 696.68 tons stronger than through the line of punched plate X X.

The butt thicknesses have to be considered in this example, which are of importance here and must have an area of section equal to the stringer plating X X.

The outer stringer A A has an area of section of half the width of the stringer plating X X and is equal to 1297.66 tons.

The strap on the under side of the butt D is 11/16″ thick by 60 inches wide. 60″ — 9 rivet holes equals 50.44 inches. 50.44 × 11/16 = 34.68 square inches. The top strap is 42 inches wide by 12/16 inches thick. 42″ — 11.25 for rivet holes equals 31.75. 31.75 × 12/16 = 23.81 square inches.

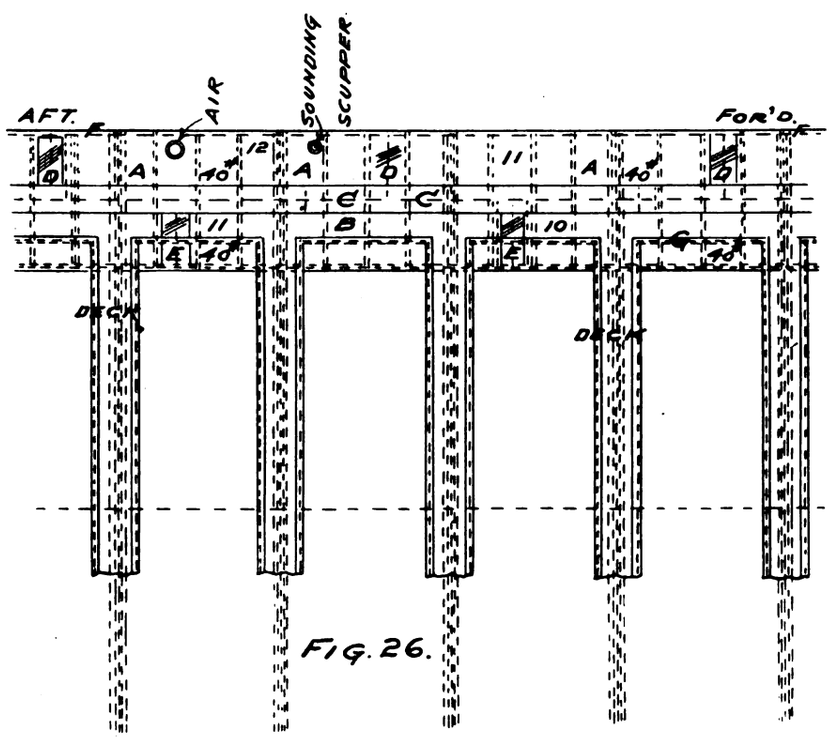

Fig. 26.

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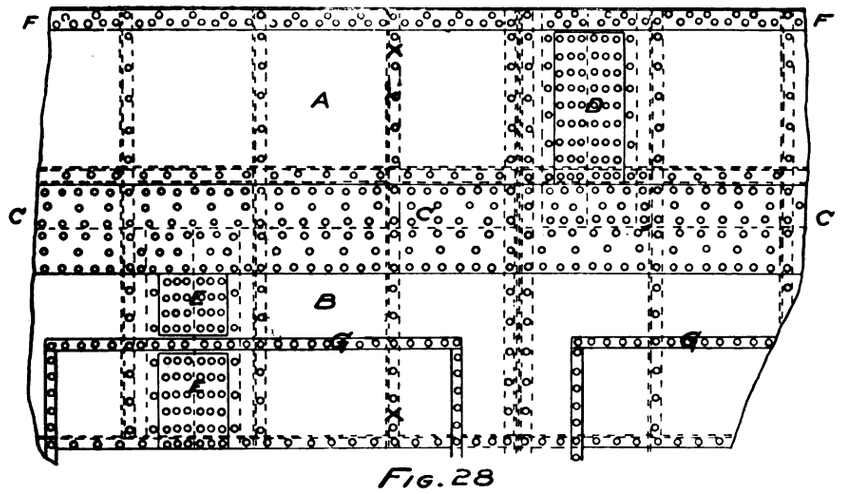


FIG. 28

23.81 + 34.68 = 58.49 square inches. The area of section of the single stringer plate amounts to 49.91 square inches.

The top strap being punched closer for calking decreases the strength per square inch to 24 tons.

The value of the butt straps to resist tension would be equal to 1472 tons and the plating through XX 1469 tons, so that the material for the butt

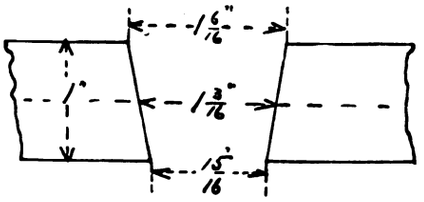


FIG. 29

strap is effective and the area of section greater than through the unavoidable weakest section X X.

The butt strap D on top is cut clear of the stringer angle F and seam strap C on the outer stringer.

The top inner strap E is cut out for the channel hatch coaming and continuous seam strap and the bottom strap is cut short of the channel fore and after leaving the same amount of material in the two straps on the inner stringer so that the same results are found in both examples.

It will be seen that the material in the butt straps are effective and the aid of the continuous seam strap and stringer angle are not considered in the calculation.

Fig. 29 shows the reason for increasing the thickness of the top butt straps. The countersinking of the butt strap increases the size of the rivet hole and decreases the metal in the plate.

The advantage of making the stringer plating in two will be seen by the number of rivet holes in the space.

Through the line X X there are 17 holes, while through the line of the butt strap across the two plates there are only 14 rivet holes.

A system of lapped butt might be adopted and the efficiency of the riveting made equal to the plating through the line X X.

This edge and edge arrangement of the stringer plating as shown by sketches makes the neatest work and allows the fitting of the seam strap C practically in one piece the whole length of the hatch openings.

The continuous seam strap can be made any width or thickness and adds considerably to the strength of the vessel in assisting it to resist both tensile and compressive strains.

Fig. 30 shows butt strap arrangement of continuous seam strap and number of rivets one inch diameter put in same.

The rivets have a double shear and are equal to 36 tons each.

The material across the beam Y Y is equal to 24" — 5" for rivet holes.

The single shear rivet is equal to 20.4 tons. The double shear rivet exceeds the area of the material and the area of the material exceeds the single shear of rivets.

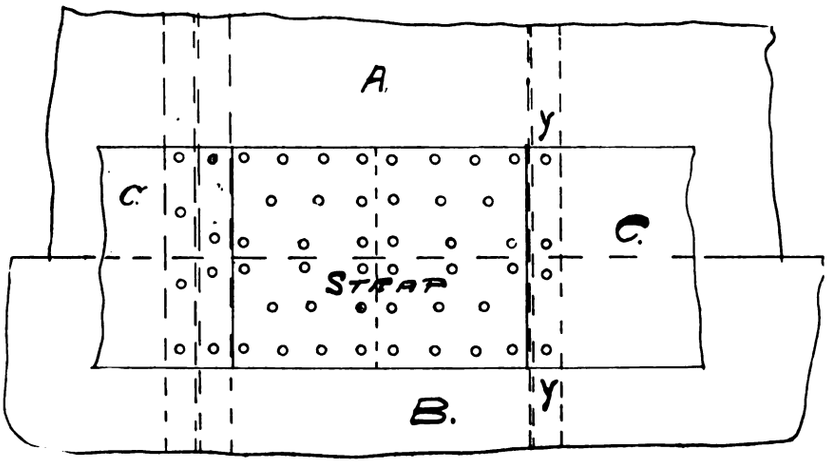
Example: Rivets single shear = 20 × 20.4 = 408 tons. Rivets double shear = 20 × 36 = 720 tons. Area of section = 24 — 5 × 26 = 494 tons.

No objections are raised to having the butt strap rivets in excess of the area of section of the material, as long as the metal is not reduced by the arrangement of the rivets.

The complications come in when the butt straps have to be made watertight and a number of rivets put in to get the material close together.

The riveting in all cases in a ship should get the preference and should always be a little in excess of the area of section.

McIntyre & Henderson, Baltimore, Md., have a steel tug under way which is to be 105 ft. long, 21 ft. beam and 11 ft. deep. She will be fitted with fore-and-aft compound engines with cylinders 15 and 30 in. in diameter and 22-in. stroke, and will have a steel boiler with 150 lbs. working pressure.



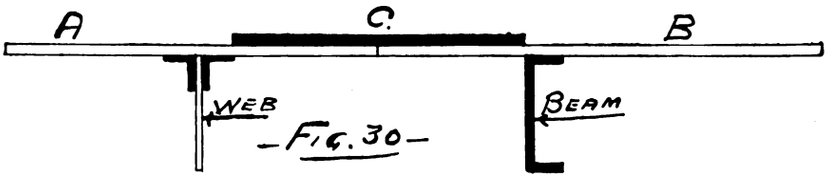


FIG. 30

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SHIP BUILDING DURING JUNE.

The bureau of navigation reports 147 vessels of 32,021 gross tons were built in the United States and officially numbered during June, 1908, as follows:

	WOOD				STEEL				TOTAL	
	Sail		Steam		Sail		Steam			
	No.	Gross	No.	Gross	No.	Gross	No.	Gross	No.	Gross
Atlantic and Gulf	11	2,507	48	821	..	.....	4	6 014	63	9,342
Porto Rico	5	36	..	.....	...	.....	....	.....	5	36
Pacific	....	.....	33	2,780	....	.....	....	.....	33	2,780
Hawaii	....	.....	....	.....	...	.....	....	.....	....	.....
Great Lakes	...	.....	20	373	....	.....	4	19,239	24	19 612
Western Rivers	....	.....	22	251	..	.....	....	.....	22	251
Total	16	2 543	123	4,225	....	.....	8	25,253	147	32.021

OUR EXPORTS BY PRINCIPAL PORTS.

BY WALTER J. BALLARD.

Comparing our exports during the 10 months ended April, 1908, with those of the preceding similar period, by principal ports, we have the following (Bureau of Statistics) figures:

Port.	Ten months, 1908.	Ten months, 1907.
New York	$602,196,244	$529,104,267
Galveston	150,909,483	222,308,775
New Orleans	141,586,364	153,765,500
Philadelphia	95,611,929	76,806,006
Boston	84,810,264	82,647,831
Baltimore	80,090,727	88,988,853
Savannah	57,942,486	57,788,178
Puget Sound	39,559,740	36,139,221
Detroit	31,305,140	32,015,125
Wilmington	28,792,020	17,882,042
Buffalo	26,896,507	27,374,316
San Francisco	24,609,265	28,201,882
Mobile	24,504,361	20,986,401
Pensacola	17,766,022	16,908,742
Willamette	16,105,476	9,046,115
Port Huron	13,062,843	12,686,902
Niagara	12,547,986	12,555,241
Brunswick, Ga.	12,147,428	10,016,201
Sabine, Tex.	12,118,603	1,979,303
Portland, Falmouth, Me.	11,063,739	13,408,576
Champlain, N. Y.	11,060,132	13,096,203
Norfolk-Portsmouth, Va.	10,685,490	6,909,933

Neither of the other ports of the country reached an export value of $10,000,000 in either period.

The New York increase of $73,000,000 and the Galveston decrease of $72,000,000 are noticeable; as are also the Philadelphia increase of $19,000,000 and the New Orleans and Baltimore decreases of $12,000,000 and $9,000,000, respectively. Pensacola, Savannah, Detroit, Buffalo, Port Huron and Niagara about held their own. Other increases are: Boston, $2,000,000; Wilmington, $11,000,000; Mobile, $3,500,000; Brunswick, Ga., $2,000,000; Sabine, Tex., $10,000,000; Norfolk-Portsmouth, nearly $4,000,000; and Willamette, $7,000,000.

As a whole, the gulf ports decreased $69,000,000; the northern border and lake ports, $8,000,000; while the Pacific ports increased $8,000,000, and the Atlantic ports, $97,000,000.

Inasmuch as the world's finances were disturbed during seven of the 10 months under review, this showing is eminently satisfactory on the whole.

FUEL FOR DESTROYERS.

The British admiralty has decided that in future all destroyers and torpedo boats shall be constructed to use coal as well as oil fuel. For the past three years all torpedo vessels built for the navy have been constructed to burn oil alone, and as the result of this innovation, and the introduction of the turbine, great ease in stoking and a remarkable increase in speed have been obtained.

The change which is now to be made is not due to any failure or defect in the oil burning system, but is designed to provide against accidents and contingencies such as may arise in war. There is no supply of oil fuel in the United Kingdom, and every gallon of oil would have to be imported. Thus security against any interruption of the oil supply is attained by fitting torpedo craft with furnaces which can burn either oil or coal.

All the modern battleships and cruisers of the navy are constructed so as to consume either coal or oil. The oil is used when spurting and forcing the pace.

INLAND NAVIGATION CO.

The Inland Navigation Co. is the title under which the various steamships heretofore operated as separate companies under the management of R. O. and A. B. Mackay, Hamilton, Ont., have been amalgamated. The new company has a capitalization of $2,000,000 and in addition to the 11 steamships acquired the wharfinger, cartage, warehousing and coal business of R. O. and A. B. Mackay at Hamilton; a shed and wharf privileges at Montreal, and the business and property of the New Ontario Dock & Coal Co., at Sault Ste. Marie, Ont. The officers and directors of the company are: President, W. Southam; vice president, R. O. Mackay; directors, G. L. Staunton, W. G. Walton, J. P. Steedman, F. H. Whitton, J. Milne, J. W. Nesbitt, G. Hope, C. W. Band; general manager, A. B. Mackay; assistant to the general manager, L. W. Doherty; secretary, F. A. Magee.

The steamship companies amalgamated are: Dundee Steamship Co.; Dunelm, Ltd.; Hamilton & Fort William Navigation Co.; Hamilton & Montreal Navigation Co.; New Ontario Steamship Co.; Rosedale, Ltd.; Union Steamship Co.; Winona Steamship Co. Following are some details of the steamers owned:

Name—	When built.	Length and breadth.	Net tonnage.
Donnaconna	1900	254′ 44′	1465
Dundee	1906	250′ 43′	1431
Dundurn	1882	190′ 30′	600
Dunelm	1907	250′ 43′	1481
Glenellah	1905	257′ 44′	1453
Neepawah	1903	253′ 40′	1190
Rosedale	1888	246′ 35′	977
Stadacona	1908	building	
Strathcona	1900	255′ 43′	1465
Wahcondah	1903	240′ 37′	996
Winona	1906	257′ 44′	1326

With the exception of the Dundurn, which was purchased in the United States, her former name being Pere Marquette II, all the company's vessels have been built in Great Britain. The Dundurn and the Rosedale are on the Canadian register, but the others are registered in Great Britain. The Stadacona, which is also of canal size, is expected out early in the fall.

Bids for the construction of the mammoth new dry dock to be built at the Puget Sound navy yard will be opened at the navy department, July 18. This structure will be the largest of its kind in the United States and one of the largest in the world, and is estimated to cost $2,000,000. It is to be completed within three years of the awarding of the contract. The dock will be 863 ft. long and 135 ft. broad, exceeding the length of the present dock by over 200 ft.

The State of Colorado is to present the cruiser named for it with a silver service at San Francisco prior to the departure of the fleet to the Orient in August. The design of the service is after Paul Revere, the revolutionary war hero, and is without ornamentation except for the seal of the state and the word "Colorado." The set is sufficient for 36 persons and is valued at $5,000.

Arrangements are being made for the dredging of the Connecticut river as far up as Springfield, Mass., for the purpose of assisting in the transportation of coal to that point. The trade will be carried on by a vessel fitted with dredging apparatus which will also be used in loading and unloading a string of barges. It is planned to make the first trip in about two weeks.

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FOREIGN TRADE WITH THE ISTHMUS.

While it is quite generally known that there is only one American steamship line operating to the Isthmus of Panama from American ports it may be surprising to some to learn that there are eight such lines which are operated by foreign interests from European ports. It is true that the United Fruit Co. does maintain a service between New Orleans and Colon via Bocas del Toro and Port Limon and that it is an American corporation, but all its vessels are of foreign register and so constitute no portion of the American merchant marine.

The great number of merchant vessels of both England and Germany have enabled these countries to drum up a very prosperous trade with the Latin-American countries of Central and South America, in addition to carrying many commodities which are required in the construction of the canal itself, a practice which it was possible for the last congress to have abolished by the passing of a joint resolution to restrict this trade to American vessels, but which came to much the same end as other legislation designed to aid this most worthy trade.

By the time the canal is completed these countries will have laid the foundations of an enormous traffic, while the United States is doing practically nothing to secure its share.

The foreign steamship lines operating in this trade, most of which have weekly sailings, are as follows:

The Compagnie Generale Transatlantique plying between Havre and Colon, via the West Indies, with two steamers of nearly 10,000 tons gross each, and having a speed of 16 knots. The Leyland Line between Liverpool and New Orleans and Colon via Jamaica. The Royal Mail Steam Packet Co., between Southampton and Colon via New York and the West Indies. The Harrison Line between Liverpool, New Orleans and Colon, via Belize, British Honduras. The Compania Transatlantica Espanola, plying between Genoa, Barcelona and Colon, via Cuba and Porto Rico. The La Veloce between Genoa, Italy, and Colon, via ports on the north coast of South America. The Hamburg-American between New York and Colon, via Port Limon, Bocas del Toro and Jamaica. The only American line plying in the Colon trade is the Panama Railroad Steamship Co., operating five steamers. All these lines carry both freight and passengers and besides them there are a large number of freight steamers under the Norwegian and British flags which supply the Panama Railroad Co., and the Isthmian Canal Commission with coal and lumber.

BOSTON MARINE NOTES.

Boston, July 8.—The fleet-footed scout cruiser Salem is again back to the yard of her builders, the Fore River Ship Building Co., there to remain about three weeks to receive her finishing touches preliminary to delivery to the government at the Boston navy yard.

When the Salem was returning from her trials, Capt. Evans sighted a disabled power-boat anchored about seven miles off Boston lightship and immediately the large ship's course was shaped toward the crippled craft. Upon investigation it was found that the 55-ft. launch was out of gasoline. Capt. Evans, who in his tow boat days in Massachusetts Bay has given a helping hand to many a "lame duck" took the little craft in tow and steamed toward Boston harbor. The launch which was an expensive one proved to be the Mickey returning from New London, Conn., where she had been attending the Harvard-Yale rowing races.

Steamship Kazembe, of the Bucknall line, arrived at the port of Boston last week from India and Ceylon on her maiden voyage with a cargo of 10,000 tons of choice teas. She is operated by a crew of 53 Lascars and left Calcutta May 17. On June 27, 1907, this ship left New York and since that time has sailed more than 50,000 nautical miles, making 32 seaports along the line. The Kazembe which has a freighting capacity of 7,700 tons is 400 ft. long and was launched at Glasgow in May, 1907.

Judge Dodge, of the United States States district court for the district of Massachusetts sitting in Boston imposed a fine of $400 on the Cunard Steamship Co., for failure to prevent an alien from landing from one of its ships before being examined by the immigration officials.

Twenty-nine thousand, seven hundred and forty-five less immigrants arrived at the port of Boston during the fiscal year ending June 30 than for the corresponding period of last year. During the fiscal year just passed 52,600 aliens arrived at Boston, compared with 82,345 of the year before, making a decrease of over 36 per cent.

Imports for the week ending June 26 amounted to $1,368,010 compared with $1,843,313 for the same week of last year. Exports for the same week of this year amounted to $1,530,974, as compared with $1,731,249 of last year.

BIDS FOR NAVAL COLLIERS.

On July 1 the navy department opened bids for the purchase of three colliers of American registry and of 7,200 tons deadweight. The Massachusetts Steamship Co., one of the four bidders, offers to sell its three colliers, the Everett, Malden and Melrose, recently built at the plant of the Fore River Ship Building Co. at Quincy, Mass., for $525,000 each. These vessels comply in every way with the requirements but the price is the limit of the appropriation. The New York Ship Building Co., of Camden, N. J., offered to construct three vessels of 11½ knots speed and 7,450 tons at $439,000 each, or two vessels at $444,000 each. The Maryland Steel Co., Sparrow's Point, Md., bids for the construction of 12-knot vessels at the rate of $403,000 for one, $397,000 each for two or $376,000 each for three, to be of 7,200 tons, twin-screw type. For single-screw type vessels of 12½ knots speed and 7,200 tons this company's bid was $377,500 each for two vessels or $370,000 each for three. The William Cramp & Son Ship & Engine Building Co., Philadelphia, Pa., bid $475,000 each for one or three vessels, to be of 11 knots speed and of 7,200 tons.

The Everett, Malden and Melrose, offered by the Massachusetts Steamship Co., are sisterships, and are the largest colliers under the American flag, each having a capacity of 7,200 tons. The vessels were built for the coal trade. They are particularly suited for deadweight cargoes, which can be loaded by means of chutes and discharged by mechanical grabs. Each has ten exceptionally large hatchways, each 28 ft. wide and 14 ft. long, with two hatches to each of the five cargo holds, which latter are each 48 ft. long. They are 400 ft. long, with an extreme breadth of 53 ft., a depth of 32 ft., and a gross tonnage of 5,107 tons. The vessels are of the single-deck type, with single screw and triple-expansion surface-condensing engines, and four single-ended Scotch boilers, constructed for a working pressure of 180 lbs. All the machinery is aft. They have towing bits and towing rail aft.

The Pusey & Jones Co., Wilmington, Del., has secured the contract for repairing light vessel No. 2 on a bid of $7,052.89.

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July 9, 1908.

OCEAN MAIL BILL.

Regret is being felt throughout the west over the defeat of the Ocean Mail Bill in the first session of the present congress. This bill, as everyone knows, was defeated by western representatives led by Mr. Burton of Ohio. Reflection on the part of the people has convinced them that the action of their representatives was unwise and already expressions of indignation are appearing in western newspapers. Such utterances as the newspapers make are quite to the point. It certainly is surprising that so much difficulty should be encountered in doing the proper, just and sensible thing for American shipping.

For instance under the caption "The Price of National Stupidty," *The Pioneer Press* of St. Paul published the following editorial:

The annual report of the United States commissioner of navigation should be interesting reading to those who throw up their hands in horror every time the problem of ship subsidy is mentioned. The value of the exports and imports by sea during 1907 was $3,002,627,317, of which foreign vessels carried $2,684,295,291. In other words, American ships carried little more than 10 per cent of our overseas traffic. We paid to the owners of foreign ships last year for carrying passengers, freight and mails more than $200,000,000. The American ships carried 80 per cent of our traffic 60 years ago and might be doing approximately the same thing today if we gave as much care to fostering our merchant marine as do the European nations.

The American merchant ships engaged in the overseas traffic are so insignificant that they make little showing. There is scarcely a first class passenger steamer flying the American flag, and there are few of the second class variety. The number of freight vessels is small. With many considerable markets outside of Europe there is practically no direct line of communication. And this state of things is likely to grow worse instead of better unless there is a more liberal and enlightened policy adopted in the interest of our shipbuilders, ship owners and sailors. We have fostered practically every other industry except our trans-oceanic shipping. We offer the richest field in the world for that traffic and stand impotently by and watch the returns pouring into the coffers of foreign concerns.

England, France and Germany have not distanced us upon the seas because they are of a higher order of intelligence. English ship builders and sailors are no more skillful than ours, but they have been encouraged. The British government, for example, pays a mail subsidy of $750,000 a year to the Cunard company for the Lusitania and the Mauretania. Furthermore, the government loaned to the company, at 2¾ per cent, the money to construct the ships. The company repays the loan in 20 years and at the same time gets annual installments of subsidy sufficient to cancel the amount borrowed, making the ships practically a gift from the government.

It is a certainty that Americans cannot compete with that sort of governmental generosity, especially when our statesmen and economists shy at so mild a phrase as "postal subvention." The mention of a ship subsidy throws them into a cold sweat. The last congress was asked to pass a very moderate postal subvention measure designed to give us a start toward securing a part of the South American and Oriental traffic and involving the expenditure of about $3,000,000 a year. The members of congress turned the measure down in spite of the fact that we pay $3,000,000 every week to foreign ship owners. We are paying $200,000,000 a year subsidy to foreigners. Couldn't we well afford to put a little more with it and get back the whole business, subsidy, $200,000,000 and all, especially if the subsidy would facilitate communication with new markets and develop freight capacity?

The manufacturer, farmer and every one else in the United States whose output is protected by a tariff gets a subsidy. It is not paid out of the government treasury, but he gets it just the same. We have legislated for the benefit and protection of the American laborer and capitalist in nearly every line of industry except shipping, and we have abandoned our sailors and ship owners to shift for themselves. Why not give them a little deserved consideration? Our foreign traffic yields a $200,000,000 revenue annually—a national resource we not only are not attempting to conserve but are stupidly handing to our competitors as a free gift and the price of our own shortsightedness and the shortsightedness of certain large interests which have wrecked several previous subsidy projects by seeking to secure too large a share of the benefits.

A special from St. Johns, Newfoundland, announces that the Newfoundland government has granted a bounty to ship owners to place contracts for ship building among the plants of the colony. The bounty varies being on a graduating scale.

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LAKE FREIGHT SITUATION.

If anything, the outlook for business on the lakes is gloomier than it was a week ago. It is true that the port of Cleveland is quite busy receiving ore and shipping coal, but that is because it is taking care of Ashtabula's tonnage. There is considerable congestion at the Cleveland docks, many boats waiting to receive and discharge cargoes. In fact, vessels are badly bunched at all Lake Erie ports where docks are in operation, some of them remaining in port nearly a week. Ore cargoes are very scarce, ore shippers having all that they can do to take care of their own tonnage. Independent boats that take up coal have to come down light. Obviously such trips are unprofitable. It would lend great firmness to the trade if the wild boats could be retired for a sensible period of time. Some of the leading shippers have not as yet put all their own vessels in commission.

Conditions on the lakes will not improve until there is a better demand for iron ore. It is observed that some furnaces are going into blast and Mr. E. H. Gary, chairman of the board of directors of the United States Steel Corporation, issued a statement just before sailing for Europe that the iron and steel business is visibly improving.

The ore shipments for June from upper lake ports amounted to 2,585,682 tons, a loss of 3,847,687 tons, compared with June, 1907. The increase over May, when only 285,315 tons were shipped is marked and the indications are that July will show a much greater tonnage than June. To July 1, the total shipments amount to only 2,870,997 tons, compared with 12,685,624 tons during the same period last year, a decrease of 9,814,627 tons. The shipments by ports were as follows:

	June, 1906.	June, 1907.	June, 1908.
Escanaba	814,664	809,876	254,496
Marquette	398,490	392,186	119,014
Ashland	556,701	554,168	250,449
Superior	885,588	1,217,729	345,845
Duluth	1,656,831	2,156,216	1,078,118
Two Harbors	1,176,982	1,303,194	537,760
Total	5,489,256	6,433,369	2,585,682
1908 decrease			3,847,687
	To July 1, 1906.	To July 1, 1907.	To July 1, 1908.
Escanaba	1,738,408	1,824,215	260,741
Marquette	802,887	769,059	119,014
Ashland	1,188,763	1,049,357	271,577
Superior	1,753,775	2,318,911	478,633
Duluth	3,181,235	4,094,046	1,164,809
Two Harbors	2,566,576	2,630,036	566,193
Total	11,241,596	12,685,630	2,870,997
1908 decrease			9,814,627

PIG IRON SITUATION.

While the iron and steel industry is now passing through the usual dullest season of the year, trade conditions are not without encouraging features. The volume of new orders, particularly bars and like products, is larger than at any time since October last. Specifications in all finished lines are being more freely received by the mills.

Aside from a slight weakening in the price of southern iron, which can now be had at $11.50 Birmingham for No. 2 foundry, quotations in other centers are fairly well sustained. Good sized purchases of pig iron have been made in the past week in the central west by implement and pump makers. Blast furnace statistics show a production of 1,134,355 tons in June, compared with 1,168,002 tons in May, a slight decrease. However, the daily average production for June was 37,811 tons, against 37,677 tons in May. Nine blast furnaces have been added to the active list for June.

M'INTOSH-HANNA COLLISION.

The new steamer H. P. McIntosh owned by the Gilchrist Transportation Co. was sunk in collision with the steamer M. A. Hanna owned by John Mitchell at Port Huron on Tuesday morning. The McIntosh had grounded on a new shoal which had formed during the winter directly opposite the Standard Oil Co.'s dock at Sarnia. It so happened that she released herself, drifting broadside down the river, just as the Hanna was passing. The collision was inevitable and unavoidable, the Hanna striking the McIntosh just forward of the boiler house on the port side, breaking a number of plates. Capt. Byers succeeded in getting the McIntosh out of the channel before she sank, water meanwhile pouring into her hold in hundreds of tons. She sank just above the Canadian Chain Works on the Canadian side. The Hanna was not badly damaged through her stem was twisted. The McIntosh was bound down with a cargo of ore and the Hanna was loaded with coal for the head of the lakes. The Hanna put back to Detroit for repairs and Capt. Harris W. Baker of Detroit was ordered to the McIntosh.

AROUND THE GREAT LAKES.

The steamer H. W. Smith and I. L. Ellwood collided at Lorain last week. The Smith has two damaged plates.

The arbitrators in the Saxona-Zimmerman collision case have fixed the damage for repairs on the steamer Saxona at $27,842.60 and $8,236.50 for loss of time. The collision occurred in April, 1906.

Car dumping machine No. 2 on the B. & O. docks at Lorain dumped 241 cars in nine hours into the steamer Earling last week. The highest previous record was 231 cars by the same machine. Wm. Campbell is in charge of the machine.

The Federal government has consented to the transfer of the life saving station at Milwaukee to McKinley Park on condition that the city of Milwaukee donates to the United States government a strip of land 206 ft. by 500 ft.

Judge Swan, of Detroit, has decided that the steamer Selwyn Eddy and the barge Maida were equally at fault for their collision in the Detroit river last season and divided the damages between them.

The barge Alex Holley grounded at Lorain this week. She was being towed into port by the tug Kunkle Bros. when the tow line parted and she drifted into shoal water.

The steamer P. A. B. Widener, of the Pittsburg Steamship Co.'s fleet, which stranded on South Manitou, will be docked at Lorain. She is leaking in No. 7 tank, but the extent of her injuries will not be determined until she is placed in dry dock.

The Hanna coal dock at Superior unloaded 9,727 tons of hard coal from the steamer James E. Davidson in 16¾ hours with three hoists. This is at the rate of 194 tons per hoist per hour, and is said to be the fastest work ever done by any coal dock on the lakes.

The Detroit & Cleveland Navigation Co. have started daily trips between Cleveland and Detroit and will continue them on Tuesdays, Thursdays and Saturdays until September. The fare is fixed at one cent a mile or $1.10 for the passage. Undoubtedly many travelers will take advantage of this daylight trip, especially as it affords an unequalled opportunity to inspect the new steamer City of Cleveland.

The steamer Siemens recently struck an obstruction below the car ferry dock at Sarnia, and an examination by the United States engineer has resulted in the discovery of a small shoal running from the docks to a point below the line of the international tunnel. It is about 700 ft. from the Canadian shore. Heavy laden down-bound boats after straightening out for the turn near the mouth of Black river should keep a course parallel to the Canadian shore until well below the tunnel.

The steamer Kotcher, upbound with coal, went aground in the St. Clair river last Saturday night, but was released without damage by the Reid Wrecking Co. It is understood that the cause of her stranding was the parting of her wheel chains.

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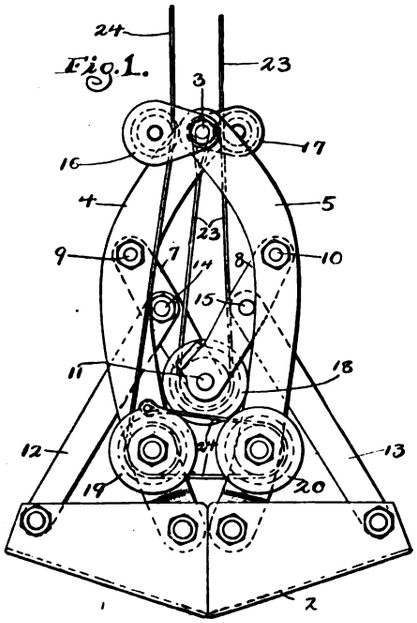
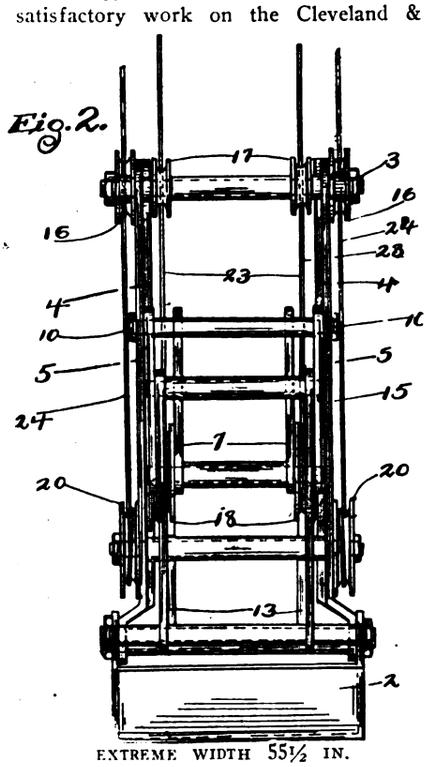
HUNTSBERY CLAM-SHELL BUCKET.

In its issue of June 18 the MARINE REVIEW published a brief description with two photographs of the new wide open-



LENGTH OF GRAB CLOSED, 8 FT. 5 IN.; HEIGHT, 10 FT. 4½ IN., FROM CUTTING EDGE TO CENTER OF MAIN SHAFT.

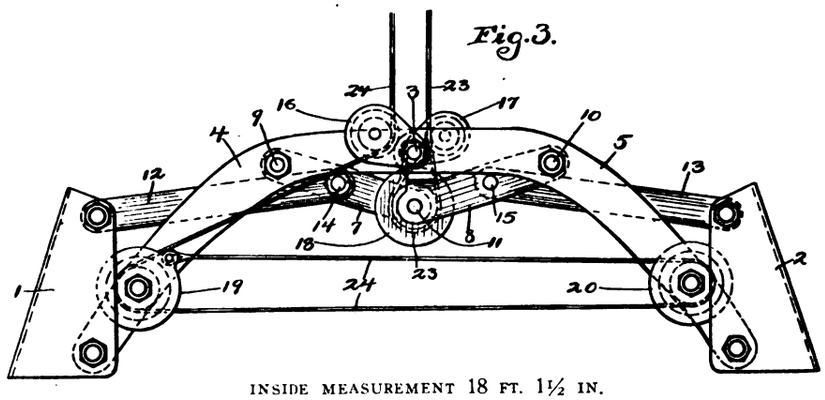
ing clam-shell bucket designed by H. E. Huntsbery, and which is doing eminently satisfactory work on the Cleveland &



EXTREME WIDTH 55½ IN.

Pittsburg ore docks at Cleveland in connection with the Hoover and Mason unloader. The patent on this bucket was granted to Mr. Huntsbery on May 19 last, and it is now possible to describe some of its technical features.

The originality of this bucket consists of providing new and improved means for suspending the respective halves of the bucket whereby its excavating power can be most advantageously applied, all

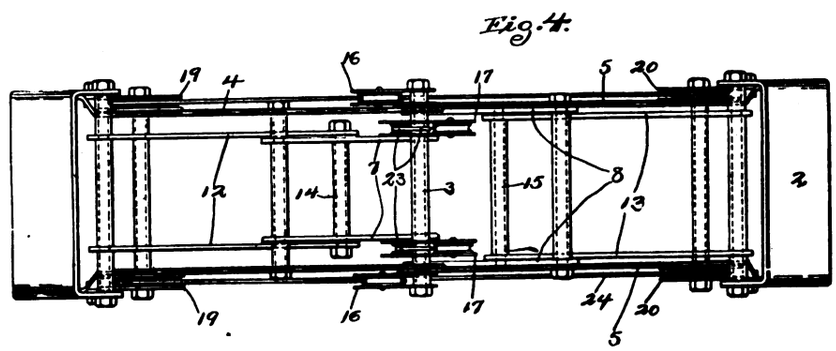


INSIDE MEASUREMENT 18 FT. 1½ IN.

packing of material avoided and the complete excavation of the material secured.

In general the bucket comprises two scoops or trays adapted to form a single receptacle or bucket when their front edges are brought into contact. These scoops are suspended from shafts by a combination of arms or links and the power for opening and closing the same is applied through a series of sheaves and ropes. The supporting and operating mechanism is so arranged that no part thereof overhangs or projects beyond the sides or ends of the bucket and consequently will not come in contact with any portion of the vessel or boat where the bucket is being used. The general arrangement of the parts is such as to secure the minimum height of structure when the bucket is closed and the maximum stretch for the length of arms, thus allowing the bucket to be readily oper-

sisting the scraping devices or hand work in getting the ore below the hatchways. Also the great stretch of this bucket, in connection with it being a power operating bucket, enables the operator by "heeling" one scoop to operate the bucket the full stretch in either direction therefrom, thereby making the working area of the bucket equal to twice the actual spread thereof. Therefore if three buckets are being operated, and one of the buckets becomes disabled, the other two buckets can be so manipulated as to practically do all the work of the disabled bucket without either shifting boat or rig. Furthermore the scoops are so mounted and supported that, when the bucket is open, the digging edge of each scoop will be further out than the top or rear edge thereof and therefore in operation the digging edge will come in contact with the bulkhead or wing of the boat while the top edge of the scoop will be a distance back from either the bulkhead, wing or stanchion which permits all vertical surfaces as well as the horizontal surfaces to be scraped by the edges of the bucket. When the bucket is open the cutting edges and the front side edges of the scoops or trays are in the same



INSIDE MEASUREMENT 18 FT. 1½ IN.

ated in the hold of a vessel between decks or in other comparatively shallow or low places, and the large area covered by the bucket when open permits the same to be used for scraping the ore together, thereby supplementing and as-

plane, and, therefore, when the bucket is lowered into the hold of a boat the entire lower edges of the scoops come in contact with the tank tops and the side edges of the scoops, therefore, prevent the cutting edges from digging into or in any

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way injuring the tank tops which would also injure the cutting edges of the scoops. Also when the bucket is open the frame and supporting arms form a strong arch which adequately resists the thrust or strains consequent upon bringing the bucket into contact with the material which is to be excavated.

In the accompanying drawings, Fig. 1 is a side elevation of the bucket closed. Fig. 2 is an end elevation of same. Fig. 3 is a side elevation showing the bucket open. Fig. 4 is a top plan of the bucket open. Referring to the drawings 1 and 2 represent the trays or scoops which together form the bucket proper. From a shaft 3 are suspended two pairs of curved arms 4 and 5 and the lower ends of each pair of arms are pivotally secured to the front end of the scoop. The lower ends of said arms are offset so that they are back from the sides of the scoops thereby leaving room for the mounting of sheaves on the outside of said arms which will not project beyond the sides of said scoops. To the respective pairs of arms 4 and 5 are pivotally secured pairs of links 7 and 8 by means of shafts 9 and 10 respectively which extend between the arms of the respective pairs of arms 4 and 5. The free ends of said pairs of links 7 and 8 are united by a shaft 11. Pairs of arms 12 and 13 are secured at their lower ends to the rear ends of the scoops 1 and 2 respectively and at their upper ends to the pairs of links 7 and 8 respectively by means of shafts 14 and 15 respectively which extend between the links of each pair of links. The arms are preferably secured to the supporting links near the center of said links, but this, of course, may be varied in some constructions. At each end of the shaft 3 is arranged a swinging pulley or guide-sheave 16 which extends out from one side thereof and a swinging pulley or guide-sheave 17 which extends out from the other side thereof. On each end of the shaft 9 is mounted a sheave 18. Near the lower end of each arm of the pair of arms 4 is mounted a sheave 19 and near the lower end of each arm of the pair of arms 5 is mounted a sheave 20. Two opening ropes 23 are provided which extend down at opposite sides of the structure, each of the ropes passing through a pulley 17 then around a sheave 18 and then up where the end is secured to the shaft 3, and two closing ropes are likewise provided, each of which passes through a pulley 16 then around a sheave 19 then around a sheave 20 and back the sheave 19 to which it is secured.

The operation of the bucket will be readily understood. A pull on the closing rope will, of course, draw the lower ends of the arms 4 and 5 toward each other causing the front ends of the scoops to swing together. As the ends of the scoops approach each other the free ends of the links 7 and 8 swing down thereby lowering the rear ends of the scoops and bringing the same into the proper position to easily pass through the material which is being excavated. When it is desired to open the bucket the closing line is slacked and an upward pull on the opening rope causes the free ends of the links 7 and 8 to swing up towards the upper ends of the pairs of arms 4 and 5, and at the same time the upper ends of said arms are drawn down toward said links so that a very powerful and quick movement is secured which will open the bucket against considerable opposition, and, therefore, when working in clinging or adhesive material there is no liability of the bucket becoming stuck in its closed position and the bucket will operate with considerable facility even when there is a great weight of material actually adhering to the scoops. This feature is also of importance as heretofore referred to when it is desired to "heel" one of the scoops and use the other scoop for scraping together the material which is afterwards to be scooped up. The operation of heeling the scoop consists simply, as is probably understood, in permitting the front end of one scoop to become embedded in a small quantity of the material and, using such a point as a center, operate the other scoop to scrape the material up to and around the quantity which has been left as the heel. In this way an area having a diameter equal to twice the stretch of the scoops can be thoroughly scraped.

In order to take up and prevent undue strain when the bucket is opened a stop 20 is arranged on each of the links 7 and is designed to abut against the ends of the arms 4 and 5 when the bucket is in its farthest open position.

WYANDOTTE LAUNCHED.

The steamer Wyandotte, building for the Michigan Alkali Co., was launched from the Ecorse yard of the Great Lakes Engineering Works on Thursday last and was christened by Mrs. John B. Ford, of Detroit. The Wyandotte, which was completely described in the MARINE REVIEW of Feb. 20 last, is a novel type of bulk cargo ship and is intended for the transportaton of coarse crushed limestone from the quarries of the Michigan Alkali Co. at Alpena to their works at Wyandotte.

The new steamer is 306 ft. over all, 286 ft. keel, 45 ft. beam and 24 ft. molded depth. The steamer was designed by Messrs. Babcock & Penton, naval architects and engineers, Cleveland and New York. A continuous double hopper extends all fore and aft through the cargo space, the cross section of the hopper having the shape of a flattened W with an extreme width of 39 ft., the extremities being carried vertically to the spar deck, thus forming high side tanks. Under the hopper and above the double bottom continuous steel belt conveyors are fitted. It is expected that the ship can be loaded in an hour and unloaded at the rate of 750 tons per hour.

The propelling machinery consists of a triple-expansion engine, 18, 29 and 50-in. cylinder diameter by 36-in. stroke, supplied with steam from two boilers, 11½ by 11½ ft., with positive heated draft and allowed a working pressure of 180 lbs. The boat will be operated by the Wyandotte Transportation Co.

NEW TRANSPORTATION COMPANY.

The new Birmingham & Gulf Railway & Navigation Co., of Mobile, Ala., which in the earlier stages of the project was better known as the Tidewater Development Co., has announced that it has purchased the Alabama river steamers John Quill, City of Mobile, Nettie Quill, W. J. Bethea, Liberty, Hard Cash, Quachita and Alert and has inaugurated a regular steamship service from Mobile via the Alabama river to Montgomery and also from Mobile via the Tombigbee river to Demopolis, Ala. The former owners of the steamboats are to continue to be identified with their operation.

As soon as the river is open for navigation above Demopolis the service on the Tombigbee will be extended to Columbus, Miss., and Tuscaloosa, at which point it will connect with the company's railroad which is now under construction from Tuscaloosa through Birmingham to Gadsden, thus connecting the mining district of Alabama with the port of Mobile.

The officers of the new company are: President, Henry S. Thompson, New York; vice president, J. M. Dewberry, Birmingham, Ala.; general manager, J. A. Vandegrift, Tuscaloosa, Ala.; superintendent, T. H. Moore, Montgomery, Ala.; John Quill, of Mobile, will also be identified with the active management.

COL. MARSHALL MADE CHIEF OF ENGINEERS.

Col. Wm. L. Marshall, who has been in charge of harbor improvements of New York, has been made chief of engineers by President Roosevelt, succeeding General Alexander Mackenzie, who retired on May 25 last for age. Col. Marshall served for 12 years as engineer in Chicago and is well known throughout the lake region.

Rear Admiral Charles Henry Rockwell died of apoplexy at Chatham, Mass., at the age of 68 years. He served in the navy over 40 years, retiring upon his own application in 1902. During the civil war he took part in numerous important engagements.

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ATLANTIC COAST GOSSIP.

Office of the MARINE REVIEW,
Room 1005, No. 90 West St.,
New York City.

Amid the cheering of about 4,000 spectators and the salutes of the numerous pleasure and business craft that ply the East river, the Roosevelt, Peary's arctic exploration ship, backed out of her berth at the foot of Twenty-fourth street on Monday, on her second dash for the North pole. The Roosevelt carries a crew of 19 into the frozen north, five of whom were on the vessel when the last trip was made. Commander Peary goes north for the ninth time, Capt. Bartlett for the third and Engineer Wardwell for the second. The expedition carries three years' provisions.

The M. E. Scully, tug, of Perth Amboy, has been purchased by the Isthmian Canal commission for use in connection with the work on the canal. The tug will be sent to Colon about the middle of this month, taking in tow two barges now being constructed at Newport News. The Scully cost $64,500.

For Isthmian canal work, also, a shallow draft steamer has been built by the Pusey & Jones Co., of Wilmington, Del., the steamer to be taken apart and shipped in sections to Panama.

The Philadelphia coasting schooner T. Touner has been sold to Capt. James T. Avery, of New Bedford, and will be fitted out for whaling.

The Parismina, Heredia and Cartago, three large steamers built for the United Fruit Co., at Belfast, will soon go into commission. The Cartago has left the builders' yards for Port Limon, and some time this month the second vessel will leave the yards. Next month will see the third in commission. After the delivery of these three boats, it is said, the United Fruit Co. will place an order for the construction of two other large refrigerating steamers.

The new Italian steamer Verona arrived at New York this week from Philadelphia. She carried 10 cabin and 874 steerage passengers and on her arrival at New York embarked 1,400 others. The Verona is a sister ship to the new Ancona, and is the latest addition to the Italian Mediterranean service.

The new British tank steamship Servian sailed from Philadelphia, in command of Capt. Brown, one of the pioneer masters in the bulk oil carrying trade, this week, with 2,188,864 gallons of refined petroleum in bulk, for Germany. Capt. Brown has been a master mariner 40 years and a master of tank steamers 23 years.

The British steamer Dulcie, before reported ashore at Zuderruk, has been floated by salvors and proceeded.

The Italian cruiser Ettore Fieramoisa arrived at Philadelphia from Rio Janeiro on Sunday, after a long cruise in southern waters. She will remain in the port for about two weeks.

The Isthmian, a new American-built steamer of the American-Hawaiian Line, arrived at New York this week on her maiden voyage from Seattle, Tacoma and San Francisco, via the Straits of Magellan. The Isthmian is a freight steamer of 3,463 tons register, built by the Union Iron Works, San Francisco, and brought a full cargo of salmon and general merchandise.

The four-masted schooner Charles H. Sprague, from Mayaguez, Porto Rico, for Philadelphia, with a cargo of cocoanuts, was towed into Hampton Roads on Sunday by the Ward Line steamer Yumuri. The Sprague had encountered very severe weather, her foremast and bowsprit being carried away and canvas blown to shreds.

The bureau of navigation, treasury department, has announced that the fiscal year ended June 30 was the record year of American shipbuilding. The tonnage, however, is entirely for domestic transportation.

Of the 170,232 passengers of British nationality who sailed for the United States during the year 1907 England accounted for 91,552, Ireland for 54,314 and Scotland for 24,366.

The dynamite-laden bark Good News, which left Philadelphia and Wilmington on January 10 for Tacoma, and which has not since been reported, was sighted on July 1 off Cape Flattery, inward bound toward Puget Sound. The vessel is in command of Capt. Eriksson, and left Delaware Breakwater on the eve of one of the greatest storms that has ever swept the Atlantic coast.

QUESTIONS FOR MASTERS AND MATES—NO. 4.

56. What is a relative bearing? Explain its use.

57. Which way do you allow easterly var. in converting a correct magnetic to a true course?

57. True course N 38° E, var. 5½° Wly., and the dev. 11° Ely.; what is the compass course?

58. What is the difference between a compass bearing and a correct magnetic bearing?

59. In which direction has the compass card turned with Ely. dev.?

60. State a rule for naming the dev. after finding its amount by the difference between the compass bearing and the correct magnetic bearing.

61. If you were to trace on a magnetic chart the line of var. having beside it, say 5° W, at what angle would you be from the true meridian all along this line?

62. What is the magnetic meridian of any place? How would you determine it?

63. You are steering NE by compass when an object on shore bears E by S by the same compass; what is its relative bearing?

64. A compass having natural dev., that is, a compass that is not adjusted, has one point of Ely. dev. with her head correct magnetic N. What would be the reading of this compass with the boat heading correct magnetic N? On S correct magnetic the dev. is of the same amount; but which way will the dev. be and what course by compass would you have to steer in order to make good the course of correct magnetic S?

65. If you took the bearing of a lighthouse by compass and you desired to lay it off from the same lighthouse on the chart, what conversion would you have to make to this compass bearing before it would agree with the chart; and which way would you allow the var. and dev. if you had any?

66. What is the latitude and longitude of Poe's Reef lightship as shown on the chart?

67. Two boats start from the same point, one steers N by E 100 statute miles, and the other N by E 100 nautical miles. At the end of each course how far will each boat be (in its own miles) from the meridian on which they started?

68. What should a log indicating nautical miles register on the course between Chicago and Pt. Betsey?

69. Why is it that a compass bearing of an object will not agree when you lay this same bearing on the chart from the same object?

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ANSWERS TO QUESTIONS FOR MASTERS AND MATES—NO. 4.

55. The direction of any object from the ship. Used in reporting a light or other object by the lookout to the watch officer.

56. To the right.

57. N 32½° E.

58. The deviation for ship's head correct magnetic.

59. To the right.

60. Correct magnetic bearing to the right of the compass bearing, dev. is Ely.; if to the left, the dev. is Wly.

61. 5 degrees.

62. A vertical circle which intersects the horizon in the magnetic poles. The magnetic N and S line or the natural direction pointed out by the compass needle when unaffected by dev. or local attraction. Determine it by applying var. at that point to the true meridian.

63. Three points for'd of the starboard beam.

64. N by W. Dev. on S will be Wly. 1 point. Would have to steer S by W.

65. Convert to true bearing. Ely. to the right. Wly. to the left.

66. Lat. 45° 41′ 27″ N. Long. 84° 21′ 22″ W.

67. 19.6 miles.

68. 207 × .87 = 180 nautical miles.

69. The compass bearing must be converted into a true bearing. Bearings and courses on the charts are true. Compass is usually affected by var. and dev.

QUESTIONS FOR WHEELSMEN AND WATCHMEN.

531. How does the land look at Pt. Betsie and south of Pt. Betsie?

532. Where is North Manitou Island lighthouse situated?

533. What is the most prominent landmark in Manitou passage?

534. What do the high sand bluffs on the east shore of Lake Michigan from Big Pt. Sable north appear like when they are first seen on the horizon?

535. Name the principal land marks between Pt. Betsie and Grand Traverse Pt. lighthouse?

536. How does Sleeping Bear Hill bear and what distance from Sleeping Bear Pt.?

537. Why is it called the Sleeping Bear?

538. About how high are the sand bluffs at Frankfort?

539. Where is Platte river reef?

540. Where is the life saving station and storm signal station at Sleeping Bear Pt.?

ANSWERS.

521. Is about 7 miles in length north and south and about 4¼ miles wide east and west at the north end and about 2 miles at the south end. It is generally hilly and wooded.

522. About 17 miles NNE.

523. High sand banks and wooded.

524. Hilly, sand bluffs and forests.

525. About 4 miles northeasterly.

526. NE ⅛ E 44 miles.

527. About 1½ miles.

528. Will be parallel with course.

529. Gull Island reefs and Richards reef.

530. Not less than 2 miles.

GEORGIAN BAY SHIP CANAL.

The report of the survey of the projected ship canal from Georgian Bay to Montreal, via the French river, Lake Nipissing, and the Mattawa and Ottawa rivers, was laid on the table by the Canadian house of commons at Ottawa, July 4. The surveys have been in progress since 1904, under the direction of A. St. Laurent, of the department of public works, and have cost about $600,000. The report gives a detailed description of the route of the proposed canal, the principal features of which have already been described in these columns. The question of the terminal at Montreal is also discussed and alternative routes have been surveyed. One route is through Lake St. Louis and Ste. Anne de Belleville, and the second by the Riviere des Prairies, or Back river to the north of Montreal Island. This latter route would develop an entirely new district of Montreal, while the other route would land the canal traffic right alongside the wharves already used by the trans-Atlantic steamers. The Back river route would, according to the estimate of the engineers, cost about $6,000,000, exclusive of land damages, less than the route through the Lake St. Louis. The estimated cost of $94,000,000 by the Back river route into Montreal, and of $100,000,000 by the Lake St. Louis route, both exclusive of land damages, provides for the construction of a 22-ft. navigable channel with locks 600 ft. long and 55 ft. wide. It is estimated that the canal will be open for traffic 200 days in the year.

The report says: "A close computation of the speed allowable in the different stretches with about three-quarters of an hour allowed for delay in the passage of each lock gives about 70 hours as the time of transit from Georgian Bay to Montreal. With the advantage of shorter distance between terminal harbors, it is computed that the route will be from one to three-fifths to two days faster than any other existing water route under present conditions from the head of the great lakes to an ocean port, apart from also having an enormous superiority as to carrying capacity. As compared with the possible improved system of St. Lawrence canals to a depth of 22 ft., assuming that the number of locks would be greatly reduced, probably no practical benefit in the time of transit could be claimed, the saving in distance being offset by the longer stretches of lake and wide river navigation which exist through the Lake Erie and Lake Ontario route, where higher speeds would be permissible channels. A careful analysis of the work to be performed shows that it would take from three to five years to develop all contracts and place the whole route under active construction. Some of these sections where heavy submarine excavation is encountered would require at least five years to complete, under the best conditions of labor and equipment. It may be fairly stated, therefore, that a period of 10 years from inception would be necessary to open the waterway to navigation. This would mean an average expenditure of about $10,000,000 per year."

The report also deals with the water powers which will be developed, or rendered accessible for development, by the construction of the canal. The development of these waterways will induce the establishment of industrial plants along the route of the canal and so provide a local traffic in addition to the through grain carrying business.

The government policy with regard to the project has not been definitely announced, but it is understood that the Montreal and Georgian Bay Canal Co.'s charter rights will be purchased, and that the canal will be constructed under the charge of a government commission, in the same way as the eastern division of the Transcontinental railway (Grand Trunk Pacific railway), from Moncton, N. B., to Winnipeg, Man., is being constructed.

At the navy department, Washington, it is stated that work upon the new battleship Florida, to be constructed at the Brooklyn navy yard, will be begun during the latter part of July.

The Engineers' Club of Philadelphia has moved to its new quarters at 1317 Spruce street, Philadelphia, Pa.

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THE USE OF OIL TO SMOOTH THE SEA.

Oil slowly dropped into the sea has a wonderful effect in preventing it breaking on board. It is common for North Sea fishermen, before beaching a boat on an exposed shore, to pull up and down for a few yards, pouring oil on the water, and then row in on the smooth.

The principles as to the use of oil are as follows:

On free waves, that is, waves in deep water, the effect is greatest.

In a surf, or waves breaking on a bar where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain; as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils have great effect.

A small quantity of oil suffices, if applied in such a manner as to spread it to windward.

It is useful in a ship or boat, both when running or lying to, or in wearing.

It is of great use when hoisting a boat up in a seaway.

In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances. Running before the wind they should be hung on either bow, as far forward as possible, and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying-to, the weather bow and another position further aft seems to be the best places from which to hang the bags, with a sufficient length of line to draw to windward while the ship drifts.

For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the circumstance of the depth of water.

For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling, if necessary.

When there are no other means of spreading oil, it can be done through the water-closet pipes, either for'ard or aft. Force a lose wad of oakum or waste into the pipe and pour the oil on top of it. After the packing has become soaked the oil will drip through at about the required rate. Instances are known where such a method has saved vessels from being swamped running before a heavy sea that would break inboard.

WEATHER SIGNAL FLAGS.

TEMPERATURE FLAGS.

The regular flag signals are:

No. 1—A white square.

No. 2—A blue square.

No. 3—A square, upper half white, lower blue.

No. 4—A black triangular flag.

No. 5—A white square with a black square in center.

Their meanings are:

No. 1, alone, indicates fair weather, stationary temperature.

No. 2, alone, indicates rain or snow, stationary temperature.

No. 3, alone, indicates local rain or snow, stationary temperature.

No. 1, with No. 4 above it, indicates fair weather, warmer.

No. 1, with No. 4 below it, indicates fair weather, colder.

No. 2, with No. 4 above it, indicates rain or snow, warmer.

No. 2, with No. 4 below it, indicates rain or snow, colder.

No. 3, with No. 4 above it, indicates local rain or snow, warmer.

No. 3, with No. 4 below it, indicates local rain or snow, colder.

No. 1, with No. 5, indicates fair weather, cold wave.

No. 2, with No. 5, indicates wet weather, cold wave.

STORM SIGNALS.

For storms and hurricane signals, three flags are used:

A red pennant.

A white pennant.

A square red flag with a black square in the center.

Storm warning—A red flag with a black center indicates a storm of marked violence is expected.

The pennants displayed with the flags indicate the direction of the wind; red, easterly (from northeast to south); white, westerly, from southwest to north). The pennant above the flag indicates that the wind is expected to blow from the northerly quadrants; below, from the southerly quadrants.

By night a red light indicates easterly winds, and a white light above a red light, westerly winds.

Hurricane warning—Two red flags with black centers, displayed one above the other, indicates the expected approach of a tropical hurricane, or one of those extremely severe and dangerous storms which occasionally move across the lakes and northern Atlantic coast.

Here is a good way to learn, and one that will always help you to remember the storm signals.

Red pennant, easterly.

White pennant, westerly.

Either pennant on top always means north; if red, northeasterly; if white, northwesterly.

Either pennant on the bottom means south; if red, southeasterly; if white, southwesterly.

When the pennants are displayed alone they represent "Information Signals," that is, there will be certain changes in the coming weather conditions that no displaying of these flags could intelligently indicate it, so that recourse must be had to the printed report itself; and this is what the "Information signal" calls attention to. If the white pennant is displayed it deals with westerly weather; if the red, easterly weather.

WEATHER INDICATIONS.

Clear Weather prophesies are, rosy sky at sunset; gray morning sky; low dawn; delicate clouds; dew; fog.

Wet Weather is foretold by an Indian-red morning sky; pale-yellow sky; small, inky-looking clouds.

Much Wind is indicated by a red morning sky; hard-edged, oily-looking clouds; gloomy blue sky; copper-colored sky.

Moderate Winds, also possibly calms are to be expected with soft-looking or delicate clouds; quiet tints or colors; dew and fog.

Weather symbols are shown by small italic letters *b* (blue sky), *c* (detached clouds), *d* (drizzling rain), *f* (foggy), *g* (gloomy), *h* (hail), *l* (lightning), *m* (misty), *o* (overcast), *p* (passing showers), *q* (squally), *r* (rainy), *s* (snow), *t* (thunder), *u* (ugly, threatening), *v* (visibility), *w* (wet, dew).

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CLOUDS AND THEIR SIGNIFICANCE.

Cirrus.—The highest and least dense of cloud formation; it is of many varieties in relation to shape and extent.

Culumus.—Known as the summer cloud. A species of cloud assuming more or less of a conical figure.

Cirro-cumulus.—Commonly known as "mackerel" sky, and "sheep in a meadow" sky, owing to the rounded wooly patches resembling sheep lying down.

Cirro-stratus.—Long layers of cloud thinner at the edges than in the center.

Cumulo-stratus.—A blending of cumulus and stratus.

Nimbus.—A combination of clouds. discharging rain, hail or snow.

Stratus.—The lowest of clouds, sometimes called the night cloud; an extended horizontal formation of clouds, the surface of which sometimes rests on the earth, forming mists and fogs.

Cumulo-cirro-stratus or Nimbus.—A mixed system of clouds; also known as *Nimbus,* the rain cloud.

Wind is denoted in the log-books by the numerals 0 (calm), 1 (light air), 2 (light breeze), 3 (gentle breeze), 4 (moderate breeze), 5 (fresh breeze), 6 (strong breeze), 7 (moderate gale), 8 (fresh gale), 9 (strong gale), 10 (whole gale), 11 (storm), 12 (hurricane).

Sea-swell is often indicated by the capital letters S (smooth), M (moderate), L (long), R (rough), C (cross), H (heavy), V H (very heavy).

INTERNATIONAL CODE OF SIGNALS.

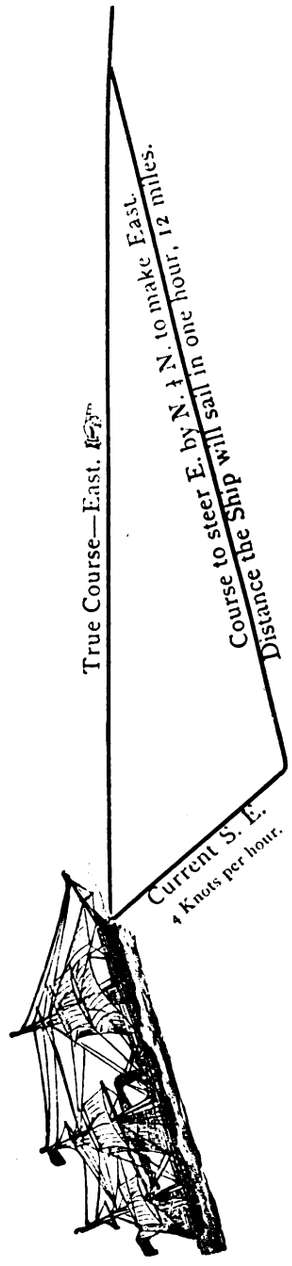
The heading is the name applied to the code of signals adopted by all maritime nations for communicating with vessels at sea, with stations along shore, etc. The code consists of one burgee, 4 pennants, and 13 square flags, from which 78,642 combinations can be made.

PRESSURE OF THE WATER AT DIFFERENT DEPTHS.

If a vessel has the flattest part of her bottom lying 16 feet deep, the water then presses 16 times as much upwards against this flat part, as it does upon any part of the same ship about the water's edge; and so on any other part, according to the depth. For example, suppose a vessel to have four leaks, or plug holes of equal size, that could be driven out occasionally—the first at 1 ft. under water, the second at 4 ft., the third at 9 ft., and the lowest at 16 ft., in the flat part of her bilge; that hole at 4 ft. deep would leak or let in as much water again, in the same time, as that at 1 ft.; and that at 9 ft., three times as much; and that at 16 ft., four times as much, though it run into the vessel upwards; and so on in proportion to the square root of the height of the water above the leak or plug hole. Therefore leaks in vessels are more or less dangerous, according to their depth under water. On first springing a leak, it will rush in faster until the water inside is as high as the place where the leak is; and will pour in less the higher it gets inside.

CURRENT SAILING.

To find the course to counteract a current: Lay off from the ship's position on the chart, the course you want to make good; next lay off from the


True Course—East.
Course to steer E. by N. ¼ N. to make East.
Distance the Ship will sail in one hour, 12 miles.
Current S. E.
4 Knots per hour.

ship's position the direction the current sets, also its rate for one hour; then with your dividers take the distance the ship will sail in one hour; place one point of the dividers at the end of the current for one hour, and let the other point touch the course you want to make good; a line from one of those points to the other will show the course you must steer to counteract the current; of course, if there is any deviation, at the point the ship's head is at, it must be allowed for.

For example, suppose you are in a current which sets SE at the rate of four knots per hour, and you are steaming at the rate of 12 knots per hour, and want to make a due east course, what course must you steer to counteract the effect of the current? It is found as follows:

First, draw a line from the ship's position to represent the course you desire to make good, which in this case is east.

Second, set off from the ship's position, the direction and distance the current runs in one hour, which is SE 4 miles. Mark this with a dot of your pencil.

Third, measure with your dividers the distance the ship will sail in one hour, which in this case is 12 miles. Place one foot of the dividers on the pencil dot you made for the current and let the other touch the true course, and where it touches the true course, mark it with another pencil dot, then take your parallel rulers and find the course between your two pencil dots, which in this case gives the course as E by N ¼ N, which is the course you must steer to make your due east course good. Remember, this course is good only for one hour.

LIGHTSHIPS AND TENDERS FOR PACIFIC COAST.

Six new vessels of the United States lighthouse service which are now under construction are to be sent to their stations on the Pacific coast under their own power about Oct. 1. The light vessels were built by the Fore River Ship Building Co., Quincy, Mass., and are to be named after the stations which they are to occupy after their arrival on the Pacific, viz., Columbia river—off the coast of Oregon, Swiftshore bank—off the coast of the state of Washington, and the Relief, which is to act as a relief vessel in the territory between the southern California coast and Vancouver straits.

The lightship tenders, three in number, are being constructed by the New York Ship Building Co., Camden, N. J., and are to be known as the Manzanita and Sequoia, both of which will work from Portland, Ore., as headquarters, and Kukui, which is to be stationed at Honolulu, Hawaiian islands.

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OUR INLAND WATERWAYS.

Prof. Emory R. Johnson, of the University of Pennsylvania, delivered an address on the navigation resources of American waterways at the recent conference on the conservation of natural resources at the White House which was followed with information of the most interesting kind and from which the following was gleaned:

The inland waterways of the United States comprise about 25,000 miles of navigated rivers, a nearly equal mileage of streams that can be made navigable by the improvement of their channels and the regulation of the flow of their waters, the five great lakes with a combined length of 1,410 miles, and 2,120 miles of operated canals. In addition to these rivers, lakes and canals there are 2,500 miles of sounds, bays and bayous, capable of being converted by means of connecting canals aggregating less than 1,000 miles in length, into an inner route for the coastwise traffic of the Atlantic and Gulf. The waterways in our country—rivers, canals, lakes and coastal channels—have an aggregate length of between 55,000 and 60,000 miles, and only about half of the entire mileage is now used for navigation.

The total appropriations made by congress from the beginning to 1907 for the rivers of the Mississippi valley amount to $208,484,720. Over $17,000,000 of this total were expended upon the Mississippi river, between New Orleans and the Gulf, and had reference rather to maritime than to inland commerce; and on some rivers, particularly the Mississippi, appropriations have been largely spent in levee construction and other work which, while indirectly helpful to navigation, was intended primarily to prevent the rivers from destroying the lives and property of those living on or near its banks. With the exception of the Ohio (including the Monongahela and Kanawha) and Mississippi and a few other large rivers, relatively little has been expended since 1890 by the Federal government in bettering river navigation. The United States has spent during the past hundred years in regulating, improving and extending our system of natural waterways only 4¼ per cent of the amount private capitalists have invested in the construction of railways.

Portions of 23 streams have been canalized to an aggregate length of 1,520 miles in 1906. This was a gain of but 442 miles over the figures for 1889.

The United States operated 12 canals in 1906 with a combined length of 78.19 miles. These, however, were constructed to overcome obstructions to lake and river navigation and were not independent waterways. In 1907 the Hennepin Canal from the Mississippi river at Rock Island to the Illinois river at its great bend was put in operation by the United States, and this waterway, 96 miles long, is the first of its kind to be managed by the Federal government. The only really important state canal is the Erie, now being modernized by the people of New York.

Provision was made 21 years ago for the systematic collection and regular publication of detailed statistics of the railroads and their traffic; but as yet congress has provided no machinery for recording and making public the facts concerning either the commerce moved or the craft operated coastwise or upon our inland waterways. The highly valuable reports of the United States commissioner of navigation contain classified information regarding documented American vessels, the aggregate tonnage of which is about six and a half million tons; but there is an equal tonnage of undocumented craft not included in the tables published by the bureau of navigation. Comparatively few people are aware of the fact that American shipping has a total tonnage of over 13,000,000 tons gross register. Similarly, the publications of the bureau of statistics contain no statistics of the mileage of our inland waterways, no information as to the commerce moved coastwise, very little data regarding river traffic, and only such figures concerning canal shipments as are collected by the states. The statistics of the traffic on the great lakes are compiled, but even these statistics are acknowledged not to cover all the commerce moved on the lakes. The bureau of the census has about completed a report on "Transportation by Water" in the United States in 1906. This, like the preceding report of that bureau made in 1889, is a valuable document, exceptionally complete as regards American shipping, but necessarily less satisfactory regarding passenger and freight traffic, for the simple reason that full and accurate information regarding traffic cannot be obtained until machinery shall have been provided for the systematic and daily recording of freight and passenger movements.

The most rapid growth since 1889 has been in the commerce of the great lakes, which rose from 25,266,978 tons of shipments in 1889, to 75,610,690 tons in 1906. The port to port traffic of the Mississippi river and its tributaries in 1906 amounted to 19,531,093 tons of freight. There was also handled locally in and about the harbors, 8,325,548 tons, making a total of 27,856,641 tons for the rivers of the Mississippi valley. In 1899 the figures were 29,401,409, there having been a decrease of 1,544,768 tons in the 17 years. The freight handled on the other inland waterways of the United States experienced a very large decline during this period, the total tonnage of freight carried having fallen from 11,221,224 tons in 1889 to 3,944,655 tons in 1906.

In order to make the statement of traffic complete the passenger business must be included. The highly efficient steamers of the lake lines carried 14,080,146 passengers in 1906; the figures for 1889 were 2,235,993, the increase during the 17 years being 529.7 per cent. There was also an increase of 30 per cent in the passenger traffic handled on the Mississippi river and its tributaries, the figure for 1889—10,858,894—having risen by 1906 to 14,122,241. It should be noted, however, that this increase was due more largely to the growth in short distance travel and in ferry traffic than to an increased patronage of the river steamboats operated over the longer routes. The passenger traffic on the other inland waterways of the United States in 1889 is not known, but it amounted to 1,877,889 in 1906.

A comparison of the United States with some of the leading countries of Europe as to the extent to which the navigation resources of each country have been developed, and as to the traffic uses made of inland waterways, will contribute to a clearer appreciation of the facts concerning the United States.

Great Britain. — Although Great Britain is of small territorial area and has not followed the policy adhered to by the continental countries of retaining the inland waterways as public highways to be developd by the government, the mileage and traffic of her streams and canals are by no means insignificant. The tidal coast line of Great Britain, 3,900 miles in length, is supplemented by about 4,000 miles of canals and improved rivers. The traffic on these inland waterways, exclusive of the coastwise maritime commerce, amounted to 37,426,886 tons in 1898, the latest year

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for which official board of trade statistics are obtainable.

The five principal estuaries of England—the Mersey, Humber, Wash, Thames and Severn—are connected by 19 through canal routes. Nine of these through routes reach Severn ports, 9 have London termini, 10 reach Liverpool and 5 terminate at Hull. The traffic is most active on the canals in central and northern England. The 642 miles of waterways in this highly developed industrial district moved 23,500,000 tons of freight in 1898. The canals reaching Birmingham had 7,750,000 tons of traffic.

There is a widespread sentiment in the United Kingdom that the country has made a mistake in permitting its waterways to pass largely into the control of the railroads. Somewhat over two years since a royal commission on canals was appointed to make a thorough investigation of the inland waterways of the country and their uses for navigation and other purposes. This body has gone about its work with the thoroughness characteristic of British royal commissions, and a comprehensive report will soon be issued.

France.—France has developed her inland waterways more systematically and completely than has any other of the larger European countries. There are 3,062 miles of canals now in operation and 4,500 miles of rivers—largely as the result of canalization—are used for navigation. Prior to 1880, the greater portion of the freight business of the country was handled on the waterways. Since then the development of the railroads has naturally enabled them to exceed the waterways in tonnage; but the waterways have, none the less, transported a steadily increasing tonnage. During the 20 years from 1885 to 1905 the freight tonnage rose from 19,573,000 to 34,030,000 metric tons. The ton-mileage of the water-borne traffic amounted to 3,178,000,000 in 1905 and was more than double the total for 1885. All the waterways of the country, with the exception of 160 miles (75 of which are owned by the city of Paris), are public ways improved and maintained by the state. Their use is free, toll having been abolished in 1880.

Germany.—The policy of Germany in the development of her inland waterways is peculiarly instructive. The canals and navigable rivers of that empire, not including the tidal portions of the rivers navigated by seagoing vessels, have a total length of about 7,600 miles, of which about 6,250 miles may be considered to be commercially important. Three-tenths of the 6,250 miles consist of canals and slack-water river navigation, and seven-tenths of river courses improved without the construction of dams and locks. The railway mileage of the country is 34,000, somewhat over six times the length of the waterways actively used for commerce.

The tonnage of the shipments and receipts of freight transported on the German waterways in 1875 was 20,800,000 metric tons. The figures for 1905 were 103,400,000 metric tons, there having been an increase of nearly 400 per cent. The ton-mileage of this water-borne commerce in 1875 was 1,812,500,000, and in 1905, 9,375,000,000—a gain of over 400 per cent. The ton-mileage of the railroad freight traffic in 1875 was 6,812,500,000, and in 1905 the total was 27,875,000,000. The gain in the railroad traffic was far greater absolutely; but the percentage of increase in water traffic was larger, although the length of the waterways in 1905 was not much greater than than in 1875, whereas the railway mileage had more than doubled during that period.

The density of traffic on the German waterways much exceeds that on the railroads. The number of tons carried one mile per mile of waterway rose from 290,000 in 1875 to 1,500,000 in 1905; the corresponding figures for the railways were 410,000 tons carried one mile per mile of line in 1875 and 820,000 in 1905. The relative importance of the traffic of the railways and waterways in Germany is shown by the fact that 25 per cent of the total ton-mileage of rail and water traffic in 1905 was water-borne, and 75 per cent moved upon rails. Thirty years earlier the waterways had 21 per cent and the railroads had 79 per cent of the combined ton-mileage.

The primary reason for the decline in the use of American canals of such small dimensions and river channels so shallow as to permit the use only of craft capable of transporting 100 to 200 tons of cargo, is to be found in the very success which the railways of the United States have had in providing cheap transportation for heavy and bulky commodities. In no other country of the world have rail transportation costs been reduced to such a low figure. The ability of our railroads to handle this class of traffic has resulted largely from the fact that by far the greater share of the tonnage of American railroads consists of such bulky commodities as coal, iron ore, lumber and grain, which can be handled not only in carload lots but in train loads and which, from the very size of our country, must be moved long distances in order to reach the manufacturing centers of the United States and the primary markets within and without our borders.

In many other countries it has been found more economical to do the heavier transportation work by making large use of waterways, and to develop the railway traffic more particularly with reference to the speedy movement and schedule delivery of parcels, packages and general commodity freight. This organization of the transportation service by rail is possible where there is a division of the transportation work between the railroads and waterways, and it results in the close co-ordination of railroad freight traffic with the wholesale and retail trade. It enables merchants and manufacturers to reduce capital costs and warehousing expenses to a minimum. It meets the needs of densely populated and highly developed industrial countries, such as France and Germany, and especially of such a country as Great Britain, for, although the inland waterways of Great Britain are, as a whole, less carefully developed than are those of France and Germany, a large share of the domestic commerce of the United Kingdom is carried by water. The navigation services which most countries can secure only by means of inland waterways, the island of Great Britain, with its 3,900 miles of tidal coast, obtains from the surrounding ocean, the best of all highways.

Such an organization of the business of transportation as has been worked out in the three European countries just mentioned, does not result in as low average freight rates by rail as prevail in the United States; but the costs of wholesale and retail distribution and of many manufacturing activities are undoubtedly less than they would be were the people of Europe served almost entirely by railroads and not by railroads and waterways. Our dependence upon railroads, almost exclusively, for the movement of bulky commodities long distances even at low average rates, while we at the same time neglect the development and use of our inland waterways, does not necessarily mean that we have organized our work of production and distribution in the most economical manner. Indeed, there can be little doubt that

(Continued on page 32.)

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THE NEWARK SHIP CANAL.

(From the *Engineering Record.*)

The project for making Newark, N. J., an important port has recently been pushed ahead vigorously. Last October the state legislature passed an act authorizing the city to construct docks and canals and acquire land for this purpose. The direction of the undertaking came under the board of street and water commissioners, which, in February, referred the subject to an advisory commission comprising Messrs. E. P. Goodrich, James Owen, Isaac P. Roe, George T. Hand, C. G. Elliott and Morris R. Sherrerd, the last named being engineer of the board. Last week this commission reported general plans for the work, which the board adopted and ordered filed with the secretary of state. Mr. Sherrerd was authorized to begin negotiations for all of the necessary land. The project is unusual because it combines in one undertaking two entirely different objects. The first of these is the reclamation of about 4,000 acres of unoccupied salt meadows within the city limits which is admirably located for several purposes but is now a waste on account of its low elevation above tide water. The second object is the connection of Newark by a deep channel with Newark Bay, so that materials may be received and dispatched in sea-going vessels.

In order to ascertain the amount of water frontage necessary for shipping purposes, the commission made studies of the probable growth in the city's population and reached the conclusion that it would be about 1,500,000 by 1950, an estimate that agrees fairly with the results of studies of the growth of cities in the vicinity made by other commissions. To arrive at an estimate of the approximate amount of wharfage which it would be advantageous to provide, an analysis of what has been constructed and what is now in use in and about the port of New York was made. The shipping of a port was classified as follows: (a) Vessels carrying foreign imports and exports; (b) Coastwise traffic; (c) River and canal traffic; (d) Inter-harbor traffic, such as ferries, etc.

The present available wharfage of the port of New York is about 1,000,000 lin. ft. Of this total only about 10 per cent is given to ocean-going vessels. The department of docks and ferries of New York City and private owners have created about 15,000 lin. ft. of additional wharfage per year for the past 10 years. Most of this increase is to accommodate ocean vessels, and the commission believes that it is apparently providing for the present rate of increase of this class of tonnage.

The possibilities of a continued increase of wharfage on upper New York Bay at a rate sufficient to care for the probable increase in ocean tonnage were investigated. Aside from possible alterations and the resulting additions in the wharfage room on the Hudson river, only certain tracts of the Brooklyn and Staten Island shores were found to be available without very great expense. The latter aggregate about 50,000 lin. ft. of water front and could be made to provide 250,000 ft. of wharfage. The committee believes that that, together with what will be made available on the Hudson river, will probably provide wharfage room to care for all requirements for the next 15 years, but the railroad connections, both on the upper Hudson and the Brooklyn and Staten Island shores, cannot be as advantageously made and cannot as easily connect with as many trunk line carriers, the report states, nor can available land for railroad transfer yards be provided in any of these locations, as would be the case on the Newark meadows.

The present practice of rehandling a large portion of the tonnage of ocean-going vessels by the use of lighters and transfer barges could in a very great measure be eliminated from a development such as proposed in the project under consideration. For the coastwise traffic, the present facilities are somewhat extensive, but there does not now exist in the port of New York any central point where trans-shipment to and from railroads can be made to embrace more than one or two trunk line railroads, whereas on the Newark meadows the possibility of getting these trans-shipment facilities to all the eastern trunk line railroads seems to be self-evident. In New York harbor the railroad facilities are now poorly adapted for economical handling from vessels to cars, necessitating additional receiving docks and freight houses, and practically all shipments of less than car load lots are lightered from the railroad shipping piers to the other freight piers in Manhattan. Other car load shipments are transferred to the steamship piers by trucks.

A very large portion of the freight handled by the numerous railroads, both east and west bound, is either import or export trade and this could be much more economically transferred to and from vessels with a saving of millions of dollars in extra dock and floating equipment by such a development as proposed on the Newark meadows, combined with a terminal operating company to provide for transfer of cars from all of the trunk line railroads. The steamships at the Newark docks could have cars of any of the trunk line railroads placed alongside, thus eliminating expensive lighterage and the maintenance of this class of harbor equipment. If Newark were provided with such a convenient method for handling foreign and coastwise traffic, the result woud soon be a centralization of this class of commerce at the port of Newark. The principal reason why the facilities in New York are and will always be inadequate for handling cargo shipments is because a small percentage of any cargo shipment is carried by any one railroad, and up to the present time the various railroads have been unable to induce ship owners to discharge vessels carrying mixed cargoes, first at one railroad dock and then at another, practically all of this class of work being handled by lighterage which could be avoided in the Newark project.

River and canal traffic would naturally follow the centralization of foreign and coastwise trans-shipment facilities except as the same may be needed for local consumption.

Referring to intra-harbor traffic, particularly such as is now handled by lighterage and transfer barges, the location of shipping facilities on the Newark meadows, giving immediate railroad connections to the north, west and southwest would certainly prove of immense advantage in reducing this class of harbor work to a minimum, and thereby reduce the cost of transportation in general.

To obtain the most favorable results to make the development proposed on the Newark meadows attractive to meet the conditions which are confronted in providing facilities for water transportation, two important factors must be considered; first, there must be ample wharfage room and deep wide channels leading to it which will not be liable to obstruction by bridges, ice floes or other impediments; second, there must be adequate railroad connection directly to the docks, and this must include, if possible, some intercommunication with all of the trunk line railroads.

One method of arriving at the prob-

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able requirements for a port of foreign shipping is through a study of the imports and exports of some existing port, and their relation to the growth of the manufactures of the vicinity. It has been found that the increase of foreign tonnage follows very closely the growth of the value of manufactures in the United States and applies to many of the coast cities. The probable future value of manufactures can, therefore, be taken in arriving at the probable needs for foreign shipping facilities at any date in the future.

Newark stands high among the cities of the United States in her per capita value of manufactured products, and compares favorably in its growth in this respect with New York City, and New York may be taken as a basis for comparison. Applying a value which obtains in New York City of $550 per capita for the value of the manufactured products to an estimated population of the city of Newark of 1,500,000 in 1950, we will then have a value for manufactured products of $780,000,000. The cost of crude material used in manufacturing in New York City is about 53 per cent of the total value of manufactured products, and assuming this ratio and applying it to the conditions of Newark in the year 1950, would give a value of $414,000,000 for crude materials used in its factories.

At the present time, for the United States as a whole, the value of crude materials imported is only about 10 per cent of the total value of crude materials employed in manufacturing. Few ports are extensive manufacturing cities, and for the city of Newark, which now stands high in the per capita value of its manufactures and certainly high in its proportion of crude materials needed, the amount of the latter that would be directly imported is likely to exceed the above 10 per cent, and, therefore, this percentage was used in arriving at the probable extent and value of crude materials imported. This gives a value of imported crude materials on the total estimated value of manufactured products of $41,400,000, and from the statistics of other ports it may be stated that crude materials form slightly more than one-half of the total importation. Therefore, it is considered safe to assume that the total value of imports for the City of Newark in 1950 will be $80,000,000. The percentage value of the exports of manufactured articles to the total value in the United States is only about 7 per cent. This would give for Newark in 1950 7 per cent of the estimated total value of manufactures, which is $780,000,000 as stated above, or an equivalent of $54,600,000 for the value of exports of its own manufactured articles. In the whole United States the ratio of the manufactured and partly manufactured exports to the total exports is approximately 58 per cent; therefore, if we consider the $54,600,000 arrived at above as representing 58 per cent of the entire exports we would have as a value for the total exports from Newark in 1950 the sum of $94,000,000, and adding to this the estimated value arrived at above of $80,000,000 for imports of crude material we would have a total value of exports and imports for the Port of Newark for the year 1950 of $174,000,000.

Now the value of imports and exports per gross vessel ton, varies widely in different ports according to the proportion of passenger vessels entering the port, which carry comparatively little freight, and according to the proportion which high class freight bears to the whole value carried. A study of these values has led to the adoption in this estimate of a value of $60 per ton of exports, which is only slightly less than that for the United States as a whole, and is exactly that of the Port of New York, and the adoption of a value of $40 per ton of imports, which is practically that of the United States a a whole, but somewhat less than that of New York.

These values per ton will give probable total tonnages for Newark in 1950 of 2,000,000 tons of imports and 1,570,000 of exports, or a total of 3.570,000 tons, while the tonnage of its own manufactures is seen to be 910,000 tons export and 1,025,000 tons of imports, or a total of 1,935,000 tons.

In order to ascertain the amount of water frontage necessary to care for the prospective tonnage, an investigation was made of what may be called the density of tonnage per annum per lineal foot of wharfage room. A fair uniformity was found and a density of 150 was considered conservative for the proposed docks of the City of Newark. This assumption makes necessary a total water frontage of piers and bulkheads of approximately 24,000 lin. ft. to accommodate the total estimated foreign tonnage for the Port of Newark for the year 1950. In addition to this wharfage room for foreign commerce there must also be provided space for coastwise, canal and river traffic. It is believed that the momentum started by a municipal expenditure of one million dollars in the reclamation of any considerable tract through the midst of the meadows and a development of shipping and industrial facilities will be such that private capital will immediately undertake enterprises on such a scale that they, together with what the city will continue to develop, will produce a practicable reclamation of the whole meadows and water front property within a decade, and furnish ample facilities for the traffic which has been stated above.

The census figures of the manufactures of the city as to values of buildings and real estate serve as a basis for a rough estimate of the possible requirements for industrial sites brought about by the development of the city and the reclamation of the meadows. Investigation shows that the assessed valuations of the several sections of the city most thickly filled with manufacturing plants average both in the aggregate and on numerous individual sites about $1 per square foot of land occupied. The present valuation of land occupied by manufacturing establishments is $8,974,000 or at the above rate 8,974,000 sq. ft. It may be contended that the reclaimed land value will never reach this figure and that each factory will occupy large tracts which can be obtained at less cost than is now possible, thus affording greater inducements for manufacturing plants locating in this section, and the area required may, therefore, be estimated at more than double the area which would be given by the use of the above figure of $1 per square foot.

It may be assumed that twice the proportionate increased area will be needed. With a present population of 300,000 in the city of Newark the manufacturing area is approximately 9,000,000 sq. ft. With a population of 1,500,000 in 1950 the area required would be 45,000,000 sq. ft. and with the probable increased area of land which may be acquired for the reasons above set forth the total area occupied might amount to 90,000,000 sq. ft., this being about one-half the full area of the meadows. It is not to be considered that it will be found advantageous for any factory to have all its property within a few hundred feet of navigable water, although it was ascertained that practically all inquiries at the present time being made for industrial sites carry the requirement of water frontage.

The area of the territory proposed to be acquired is 12,500 ft. long by 4,000 ft. wide, or 1,150 acres in all, which will make possible a reclamation of 40,000,000 sq. ft. of land exclusive of water

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surface. The riparian rights should be acquired for the full 4,000 ft. frontage on the bay.

This tract of land extends westward from Newark bay and it is proposed to bound it on the north and on the south by a main thoroughfare 150 ft. wide. The main canal will lie midway between these thoroughfares and will be 1,650 ft. from each of them. It will be 700 ft. wide and designed for an ultimate depth of 30 ft. at low water. Provision has been made for large ships for regular ocean and coastwise shipping lines at the entrance to the canal and for public wharves at various places along its length, but the greater part of the space behind the bulkheads bounding it will be utilized for either manufacturing or transportation purposes, as the necessities of the future may show to be desirable. Connections can be made with the Pennsylvania, Lehigh Valley and Central of New Jersey roads, which are in the immediate vicinity and heartily endorse the project. A connecting railroad running to other lines as well is strongly recommended by the commission. Provision is made in the plans for street and trolley connections, and the head of the ship canal will run almost into the heart of the city.

The second feature of the enterprise is the filling of the meadow land so as to increase the area of the city that is capable of profitable utilization. The customary method of carrying out such improvements would be to open and grade the streets, then fill in the lots, and eventually put in the curbing, sidewalks, water mains and sewers. If this improvement were made by filling carried out in the usual manner the cost of improving 950 acres would be about $9,066,830. If the filling were done by the hydraulic method, it is estimated that the cost of improving the 950 acres would be $5,136,700, or $3,930,100 less, and in addition a navigable channel would be constructed during the process. These figures are given by the commission to show that even were its sole object the reclamation of the meadows, the most economical method of doing the work would be by constructing a canal.

The initial work, to which the city is now committed, comprises the expenditure of $1,000,000 for dredging a channel from the bay to the shore line, excavating a section of the ship canal 350 ft. wide and 22 ft. deep for a distance of 3,400 ft., building a permanent bulkhead along the north side of this canal, filling the meadow land north of this bulkhead for a distance of 2,000 ft. and making various improvements in sewers and roads. The commission believes that this amount of water frontage will be taken up in a comparatively few years and by that time the city will be in receipt of a revenue warranting it to go ahead with another installment of the work.

COMMERCE OF LAKE SUPERIOR.

The commerce of the Sault Ste. Marie canals for June, 1908, was 4,334,183 tons, as against 8,865,442 tons for June, 1907, a decrease of 4,531,259 tons. The movement of freight to July 1 of the present year has amounted only to 6,002,325 tons, being therefore 2,863,117 tons less than the movement for the single month of June last year. The movement to July 1, 1907, was 17,788,319 tons, which is in excess of the movement for the corresponding period this year of 11,785,994 tons. Following is the comparative statement of the commerce brought up to July 1 of the present year with corresponding data for the two preceding years:

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

Items—	To July 1, 1908.	To July 1, 1907.	To July 1, 1906.
Coal, anthracite, net tons	364,914	435,940	192,084
Coal, bituminous, net tons	1,396,961	3,305,572	2,111,114
Iron ore, net tons	2,733,430	11,840,412	10,366,948
Wheat, bushels	22,442,683	30,016,884	21,354,474
Flour, barrels	1,179,406	1,709,465	1,578,148

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR FROM OPENING OF NAVIGATION TO JULY 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.

Items —	To July 1, 1908.	To July 1, 1907.	To July 1, 1906.
Copper, net tons	27,484	22,100	34,301
Grain, other than wheat, bushels	7,293,272	14,189,677	18,052,688
Flour, barrels	1,179,406	1,709,465	1,577,968
Iron ore, net tons	2,733,430	11,840,412	10,366,948
Iron, pig, net tons	4,364	6,431	8,317
Lumber, M. ft. B. M.	112,227	221,918	277,093
Wheat, bushels	22,442,683	30,016,884	21,354,474
Unclassified freight, net tons	20,583	21,699	58,433
Passengers, number	4,052	4,554	5,085

WEST BOUND.

Items —	To July 1, 1908.	To July 1, 1907.	To July 1, 1906.
Coal, anthracite, net tons	364,914	435,940	192,083
Coal, bituminous, net tons	1,396,961	3,305,572	2,111,114
Flour, barrels	.....	.....	180
Grain, bushels	700	.....	6,749
Manufactured iron, net tons	82,602	96,187	121,241
Salt, barrels	199,915	157,085	151,183
Unclassified freight, net tons	190,592	278,137	316,707
Passengers, number	4,809	4,534	6,170

SUMMARY OF TOTAL FREIGHT MOVEMENT.

Items —	To July 1, 1908.	To July 1, 1907.	To July 1, 1906.
East bound freight of all kinds, net tons	3,937,509	13,649,105	12,112,667
West bound freight of all kinds, net tons	2,064,816	4,139,214	2,765,113
Total freight, net tons	6,002,325	17,788,319	14,877,780

Total number of vessel passages to July 1, 1908, was 3,295, and the net registered tonnage, 4,775,940.

OUR INLAND WATERWAYS.

(Continued from page 29.)

as social and industrial conditions in the United States approach more closely those prevailing in Europe, we shall find it increasingly desirable to provide ourselves both with well-developed waterways for handling much of our bulky traffic, and with railroads more efficient than present conditions permit them to be in the handling of package freight. We, as well as Europe, will find it profitable to minimize capital and warehousing costs.

The construction of canals and the improvement of rivers in the United States have progressed slowly, in part at least, because the Federal government has in the past left to the states the work of canal building, and, to some extent, the canalization of rivers. Several of the states, after having made costly mistakes in the execution of their earlier works of internal improvement, have been disposed to leave to private capital the creation of such waterways as special business interests might find it profitable to establish. In many instances the states have thought best to dispose of their waterways to the railroad companies, which have generally found it unprofitable to maintain both rail and water routes. The policy of leaving the development of water transportation to any considerable extent, either to the states or to private corporations, is now realized to be wrong in theory and unsatisfactory in practice.

As a consequence of the failure to reach an agreement by the joint commission of the Russian Duma and the Council of the Empire, which was recently created for the purpose of conferring regarding the naval budget—the 1907 budget still remains in force. The Council of the Empire had adopted a budget which provided for an appropriation of $5,500,000 for new battleship construction, although the Duma had previously refused to sanction such an item. The 1907 budget contains an item for $18,000,000 of new construction and the fundamental laws provide that in case the representatives of the Council and Duma fail to agree the previous regular budget shall take effect.

The Great Lakes Towing Co. has stationed the lighter T. F. Newman at South Chicago.

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Accidents of a Month

Herewith is published a brief summary of the accidents which have occurred on the lakes during the past month. In most instances the damage to the various vessels has been slight, though eight vessels had to be docked for repairs. The vessel sustaining the greatest injury was probably the steamer Howard L. Shaw, which collided with the steamer Hoover and Mason at the Sault. The Shaw had seven stern plates damaged down to her bilge, and it took about 10 days to repair her.

DATE.	NAME OF VESSEL.	NATURE OF ACCIDENT.	PLACE.
June 11	Str. Wexford	Grounded; released after lightering 400 tons	Buffalo harbor.
June 13	Str. Wilpen	Struck Interstate bridge; slightly damaged	Duluth.
June 13	Str. City of Cleveland	Bow rudder disabled	Lake Erie.
June 13	Str. A. W. Thompson	Stuck in draw of Superior street viaduct; uninjured	Cleveland.
June 15	Str. Sligo	Donkey boiler rolled over while out in heavy sea; went to Cleveland to be repaired	Lake Erie.
June 15	Str. G. W. Perkins	Struck pier while leaving port; large hole in side; docked at Lorain	Conneaut.
June 17	Bge. Peterson	Collided with a dredge; stem broken off below water line; planking, railing and anchor carried away; repaired at Port Huron	St. Clair river.
June 17	Dredge No. 8	Collided with barge Peterson; dipper arm and upper works badly damaged; repaired at Port Huron	St. Clair river.
June 17	Str. Gilchrist	Dragged her bow along Reis dock, badly damaging hoisting rigs	Sheboygan, Wis.
June 18	Str. Arundell	Ran aground; released June 20, badly damaged; docked for repairs	Alexandria Bay.
June 19	Str. Kearsarge	Struck State street bridge, damaging it slightly	Chicago harbor.
June 19	Str. Langell	Struck bottom; broke wheel; docked at Buffalo	Niagara river.
June 20	Str. J. J. Boland	Ran aground, released, uninjured, on June 22 after lightering	Point Edward.
June 20	Bge. Atmosphere	Ran into steamer City of Mt. Clemens	Bell river.
June 20	Str. City of Mt. Clemens	Hit by barge Atmosphere; damage estimated at $1,000	Bell river.
June 21	Str. Hoover & Mason	Collided with steamer Howard L. Shaw; slightly damaged	Sault Ste. Marie, Mich.
June 21	Str. Howard L. Shaw	Collided with steamer Hoover & Mason; seven stern plates damaged down to bilge; docked at Lorain	Sault Ste. Marie, Mich.
June 22	Str. Cherokee	Ran aground; released, uninjured	Grassy Island, Detroit river.
June 22	Schr. Chippewa	In tow of steamer Cherokee; not damaged	Grassy Island, Detroit river.
June 22	Bge. Nellie Holland	Struck Steamer Donaldson; hole, 12 x 5 ft. just above water line	Lake Superior, at entrance to Sault canal.
June 22	Str. Donaldson	Struck by barge Nellie Holland; anchor carried away and several plates on starboard side damaged	Entrance to Sault canal.
June 23	Str. John Stanton	Dropped anchor while leaving port	Indiana harbor.
June 23	Str. John F. Eddy	Wheel chains parted	Niagara river.
———	Str. A. W. Thompson	Stranded; number of plates damaged; docked at Cleveland for repairs	Gull Island Reef, Lake Michigan.
June 26	Str. E. L. Wallace	Lost her anchor	Sandusky harbor.
June 28	Str. Kotcher	Steering gear disabled; ran aground; released, uninjured	St. Clair river.
June 29	Str. Warrington	Hit obstruction; lost her rudder	Breakwater, Cleveland, O.
———	Str. Lehigh	Broke her wheel; towed to Chicago	Straits of Mackinac.
July 1	Str. H. W. Smith	Collided with steamer Ellwood; two damaged plates	Lorain.
July 1	Str. I. L. Ellwood	Collided with steamer H. W. Smith	Lorain.
July 3	Str. Philip Minch	Ran on shoal; released herself, uninjured	St. Clair river.
July 3	Str. Michigan	Wheel chains parted; ran aground	St. Clair river.
July 5	Str. Widener	Stranded; tanks Nos. 7 and 8 punctured; docked at Lorain	S. Manitou Island, Lake Michigan.
July 5	Str. Nyanza	Ran aground	Gray's Reef.

NEW PRESIDENT FOR MERCHANT MARINE LEAGUE.

In furtherance of plans to wage a most aggressive campaign before the next session of congress for "the restoration to the high seas of the American flag," the Merchant Marine League of the United States has elected Joseph G. Butler Jr., of Youngstown, O., to its presidency. He will fill the vacancy created by the resignation of President Harvey D. Goulder, which was reluctantly accepted recently solely upon his insistence that his private business interests are demanding more of his time and closest attention. However, Mr. Goulder has made it plain that his every possible endeavor will be exerted toward forwarding the patriotic purposes of the league.

President Butler is a widely known authority on pig iron. He is now and for years has been general manager of the Brier Hill Iron & Coal Co., pig iron manufacturers at Youngstown. When the Bessemer Pig Iron Association was formed, Mr. Butler was chosen its first chairman, and still occupies that position.

JOS. G. BUTLER JR.

When but a youth, he became connected with iron manufacture through Governor David Tod and John Stambaugh Sr., both now deceased.

Aggressive and active, a keen student both of men and affairs, Mr. Butler brings to the presidency of the Merchant Marine League the wealth of years of experience in public affairs and the results of close and long continued study. Keenly alert to note every good thing that makes for the future progress and prosperity of the country, Mr. Butler early became an enthusiast for the rehabilitation of the merchant marine of the United States. No sooner had the Merchant Marine League been organized in the city of Cleveland in November, 1904, that Mr. Butler became an active member. Since that time he has aided in its growth in every possible way, and has strengthened it in its purpose by his wide influence.

The United States district court at Honolulu has decided the salvage suit brought by the Commercial Cable Co. against the Pacific Mail Steamship Co. by awarding the former company $61,000 for the services rendered by its cable repair ship Restorer in salving the big steamship Manchuria after she had run on the reef off Rabbit island near Honolulu during a storm in August of 1906.

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SHIP YARD NOTES.

The Risdon Iron Works, San Francisco, Cal., has secured a contract for repairing the British steamer Braemont.

The navy department is about to ask for bids for the construction of the eight submarines authorized by the last congress.

The Union Iron Works, San Francisco, Cal., has been awarded contract for effecting repairs to light vessel No. 70 at a cost of $1,820.80.

The Risdon Iron Works, San Francisco, Cal., has the army transport Logan at its yards for a thorough overhauling which is to cost $275,971.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., will deliver the new armored cruiser Montana to the navy department, July 15, at the Norfolk navy yard.

The Bishop ship yard at Gloucester, Mass., has a fishing schooner under construction for Boston owners, which will be launched some time this month. She is to be named Athenia.

The John N. Robins Co., Erie Basin, Brooklyn, N. Y., has had the British steamship Anselm at its yard for repairs. She stranded on English Cay in February while bound from New Orleans to Balize, B. H.

The Sharptown Marine Railway, Sharptown, Md., recently launched the barge Timothy J. Hooper for John T. Donohue & Co., of Baltimore. She is 200 ft. long and 35 ft. beam.

M. Mitchell Davis, Solomon's, Md., has launched the tug Esther Phillips, which he is building for Capt. Vivian Phillips, of Baltimore. She is 70 ft. in length, 16½ ft. beam and 8 ft. depth of hold.

The ship building firm of J. T. Dickie & Son, Raymond, Wash., is now in the hands of a receiver, who has asked an order from the court to permit the completion of a steam schooner which is now under way there.

The Fore River Ship Building Co., Quincy, Mass., recently delivered two of the lightships, Nos. 92 and 93, which it has been building for the government. No. 92 is to be stationed at San Francisco and No. 93 at the Swiftsure Bank, Puget Sound.

The United States naval tug Patapsco, which is being built at the navy yard at Portsmouth, N. H., was launched June 30. The Patapsco is 160 ft. long and will cost $150,000. She will be capable of accompanying a naval squadron on any expedition.

The W. & A. Fletcher Co., Hoboken, N. J., is engaged in finishing the interior of the big turbine yacht Vanadis, recently built on the Clyde for C. K. G. Billings, of Chicago. She was brought to this side owing to a strike in the Scotch yards which hindered her completion.

J. M. Hammitt, Marietta, O., has been awarded contract by Capt. Parminter, of Nashville, Tenn., for the construction of a fine steamboat for service on the Cumberland river. The vessel is to be 150 ft. long and 33 ft. beam and will have Marietta boilers and machinery. Her cost is to be over $20,000.

The Bath Iron Works, Bath, Me., was damaged by fire recently to the extent of $90,000. Eight torpedo boat boilers, 12 torpedo tubes and many patterns and spars were destroyed. The loss is fully covered by insurance. The origin of the fire has not been discovered.

The Robert Palmer & Son Ship Building & Marine Railway Co., Noank, Conn., launched the tug Henry J. Crew on June 29. She is building for the White Star Towing Co., of New York and is 90 ft. long, 24 ft. beam and 10 ft. deep. Her engines will be built and installed by John W. Sullivan, of New York.

The submarine torpedo boat Octopus, built for the Electric Boat Co. by the Fore River Ship Building Co., Quincy, Mass., was formally accepted by the navy department recently. She was placed in commission at once and has joined the second submarine flotilla at the port of New York.

The Fore River Ship Building Co., Quincy, Mass., has recently been awarded a contract by the United States war department for the construction of eight of the 12 ocean-going revenue tugs which are to be built for that branch of the government. The other four are to be built on the Pacific coast.

Advices from Chester, Pa., are to the effect that the Delaware River Ship Building & Engine Works, which has been put under the control of the Roach interests since 1871, will be put on the market in order to settle the estate of the late John B. Roach, the heaviest creditor of the company for loans advanced from time to time.

The Sanford & Brooks Co., Baltimore, Md., has two six-pocket scows in frame which it is building for the United States engineer corps for use at Wilmington, N. C. Both are alike and are of the following dimensions: Length, 120 ft.; beam, 32 ft., and depth, 10 ft. It is intended to launch both scows at the same time, sideways.

Joseph Supple, the Portland, Ore., ship builder, has submitted a bid for the construction of the four single-screw revenue steamers which the war department has announced are to be built on the Pacific coast. The craft are to be built of wood, will be 60 ft. long and are expected to cost about $30,000 each.

William E. Woodall & Co., Baltimore, Md., recently completed extensive repairs to the United States engineer corps' suction dredge Cape Fear and she has left for her station at Wilmington, N. C. The vessel was docked, stripped, caulked and remetaled, had stern renewed and sand pockets overhauled, as well as painted throughout.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa., is engaged in extensive repairs to the Panama Railroad & Steamship Co.'s steamer Colon. She is expected to take up her service again by the middle of the month when the steamer Panama will be sent to the same concern for an overhauling. Both vessels will have their passenger accommodations considerably enlarged.

President McGregor of the Union Iron Works, San Francisco, and President Hibbs, of the Moran Co., Seattle, Wash., are quoted as saying that they believe it likely that some of the contracts for constructing torpedo boats and gunbots authorized by the last congress will go to Pacific coast builders, and each expects to get his share by determined effort.

Crawford & Reid, Tacoma, Wash., have secured the contract for building a speedy stern-wheel steamer for the Olympia & Tacoma Navigation Co., of Tacoma, to be used exclusively in the passenger service which that company conducts between those two cities. The new craft will be 151 ft. long, 22 ft. beam and 6 ft. deep and will have engines of 16-in. diameter with a 7-ft. stroke. The boiler will be of the fire-box marine type, 7 ft. in diameter and 22 ft. in length. The cost of the new vessel is estimated at $40,000 and she will have accommodation for 300 passengers. She is designed to maintain a speed of 17 knots.

The negotiations which have been entered into by the Boston Steamship Co. for the sale to the government of its steamships Shawmut and Tremont for the use of the Panama Canal Commission, have progressed to such a stage that a board of special survey is soon to go to Seattle for the purpose of inspecting the vessels in dry dock and reporting to the government as to their condition and value. These steamers are managed by Waterhouse & Co., of Seattle, Wash., in a regular service to the Orient and are known to be in first class condition, having been surveyed last year.

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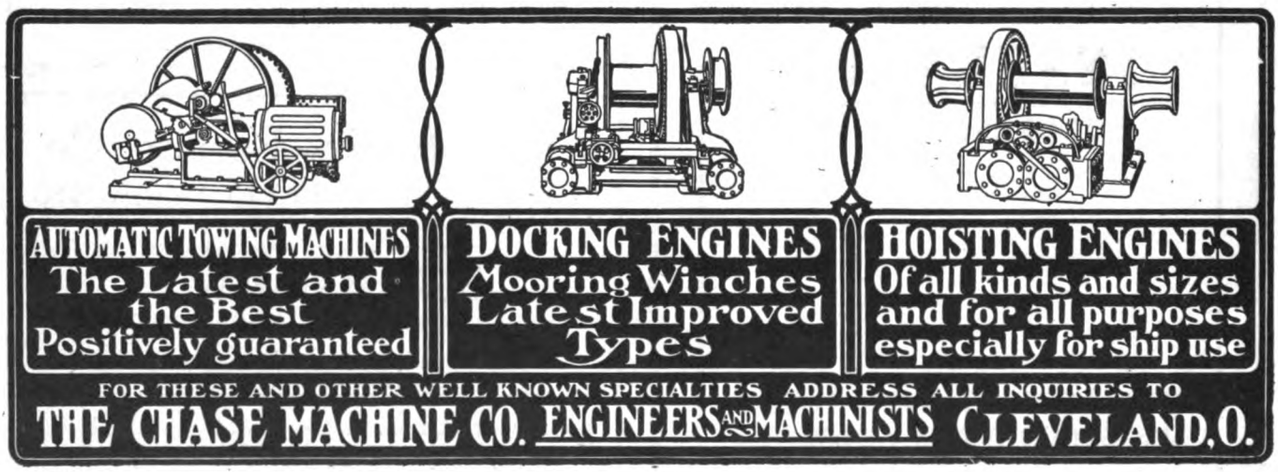

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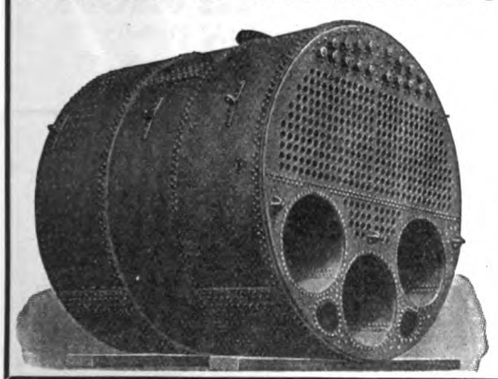

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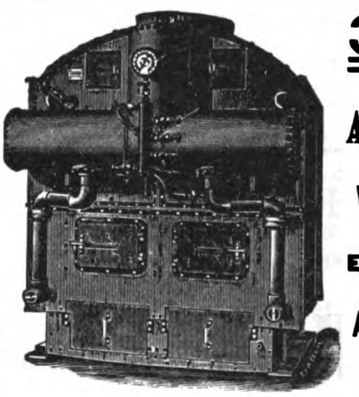

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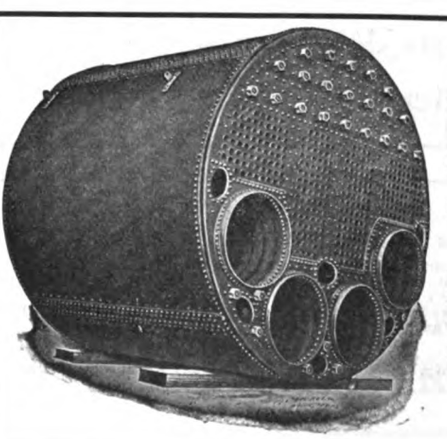

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CLASSIFIED ADVERTISING SERVICE

PROPOSALS.—SALE OF U. S. VESSELS St. Mary's and Shearwater. Sealed proposals will be received at the Navy Department until noon on the 5th day of August, 1908, at which time and place they will be opened, for the purchase of the U. S. S. vessels St. Mary's and Shearwater, appraised values $4,000 and $1,200, respectively. They will be sold for cash to the person or persons or to the corporation or corporations offering the highest price therefor. A separate proposal for each vessel bid upon must be submitted in a sealed envelope addressed to the Secretary of the Navy, Washington, D. C., endorsed "Proposals for the purchase of the U. S. S. ....." (naming the vessel for which offer is made), and each proposal must be accompanied by a satisfactory certified check for not less than 10 per cent of the amount of the offer. On application to the Navy Department, forms of bids and bonds, together with the terms and conditions of sale, also a printed list giving general information concerning these vessels will be furnished. The vessels can be examined at any time after this date by applying to the Commandants of the navy yards, New York, N. Y., and Philadelphia, Pa., respectively, where they now lie. They must be removed from the limits of said yards within such reasonable time as may be fixed by the Department. The Department reserves the right to withdraw either or both of the above-named vessels from sale and to reject any or all bids. TRUMAN H. NEWBERRY, *Acting Secretary of the Navy.* June 30, 1908.

SMALL STEAMER FOR SALE. Carrying capacity about 275 tons. Makes between 10 and 11 miles per hour; length 117 ft. overall, beam 24 ft., depth 8 ft. Rebuilt last fall; engine 18 x 20; boilers in first class condition. Derrick forward, lifting capacity between seven and ten tons. Entire new outfit on boat last fall. Would make a good sand sucker or could be used for contracting. Address Box 129, the MARINE REVIEW, Cleveland, O.

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PROPOSAL

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., June 30, 1908. Sealed proposals for Repair of South Pier at Grand Haven, Mich., will be received here until 3 P. M., July 14, 1908, and then publicly opened. Information on application. M. B. Adams, Col., Engrs.

U. S. Engineer Office, Milwaukee, Wis., June 26, 1908. Sealed proposals for dredging at Manitowoc Harbor, Wis., will be received here until 2 P. M., July 16, 1908, and then publicly opened. Information on application. W. V. Judson, Major, Engrs.

U. S. Engineer Office, Jones Building, Detroit, Mich., June 18, 1908. Sealed proposals for dredging Hay Lake and Neebish Channels, Saint Marys River, Michigan, will be received at this office until 3 P. M., July 21, 1908. Information on application. C. McD. Townsend, Lt. Col., Engrs.

U. S. Engineer Office, Jones Building, Detroit, Mich., June 17, 1908. Sealed proposals for furnishing and delivering at St. Marys Falls Canal, Michigan, about 1,328,000 feet B. M. of hemlock timber will be received at this office until 3 P. M., July 17, 1908, and then publicly opened. Information on application. C. McD. Townsend, Lt. Col., Engrs.

FOUR YARD DIPPER DREDGE with Scows and Tug For Sale. Good condition. Address "Dredge," care the MARINE REVIEW, Cleveland, Ohio.

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Quintard Iron Works Co..... .....New York.
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Toledo Ship Building Co....Toledo.

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